NEVADA STATE MUSEUM
ANTHROPOLOGICAL PAPERS NO. 8

ARCHAEOLOGICAL SURVEY
IN
SOUTHWESTERN IDAHO
AND
NORTHERN NEVADA

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INTRODUCTION

In April, 1962, the Nevada State Museum received an Antiquities Act Permit from the Department of Interior authorizing archaeological explorations along the proposed route of the Nevada Northern natural gas pipeline, a transmission facility for carrying natural gas from a meter station on the Pacific Northwest Pipeline near Mountain Home, Idaho to the Reno, Nevada area.

The pipeline right-of-way is some 26 feet in width, and approximately 350 miles long. Much of the land crossed by the pipeline is Public Domain, whose antiquities are protected by the Federal Antiquities Act of 1906. The technical and legal precedents for archaeological salvage work on such pipeline projects have long been established (Wendorf and others 1956; Wendorf 1962). It is a pleasure to report that once again officials of the El Paso Natural Gas Company and the Nevada Northern Gas Company have given full support and cooperation to the archaeological program.

It is customary for the initial archaeological reconnaissance of a proposed pipeline right-of-way to be carried out well ahead of construction. In the survey reported here, the engineering crews began staking the route in Idaho in May, 1962, and by the middle of that month a two-man survey team, Mr. Raymond Brazzanovich and the author, had entered the field and were following a trail of bright orange flags. In July, 1962, Mr. William Twitchell joined the party, and by the end of August the surface survey was completed, long before the archaeologically-destructive construction activity began.

The field methods employed in the survey were conditioned by the topography encountered. The Nevada Northern line originates on the Payette subsection of the Columbia Plateau physiographic province, an area of deeply dissected basalt flows and exposed tertiary lacustrine and riverine deposits. The route proceeds due southwest from Mountain Home, Idaho, passes through a small portion of Elmore County, crosses the Snake River above the C. J. Strike Reservoir, and heads diagonally across the heart of Owyhee County, Idaho (Map 1). At the state boundary, the proposed right-of-way crosses the deep canyons of the Owyhee River and continues through the Columbia Basin drainages of northern Nevada.

A physiographic break occurs in the landscape north of Paradise Valley, Humboldt County, Nevada. Here the Columbia Plateau, with its ever-present basalt outcroppings and its drainages reaching the Pacific Ocean, yields to the interior drainage pattern of the Basin and Range physiographic province.

In Idaho, where the pipeline route skirts some deep canyons and crosses others, the right-of-way was examined on foot. Once the Lahontan Basin sub-section of the Great Basin was entered, it was found expedient to use our four-wheel drive vehicle to examine the ground surface. Driving along the staked out right-of-way with one man seated on each side of the pick-up truck's bed proved to be a very effective way of locating sites, which were less numerous along the right-of-way in the central portion of the Carson-Humboldt Basin than those recorded in Owyhee County.

When the surface survey was completed and construction of the line was about to begin, it was decided that an examination of the pipeline trench, traditionally a part of pipeline salvage archaeology, could be eliminated. Several factors affected this decision. First, we were impressed by the apparent lack of depth present at all the open sites. More than once, we were able to pick up all the waste flakes present at a chipping station. Second, those sites we did excavate or test all lacked deep cultural deposits (See Appendix C, p. 83). Third, our experience on other pipeline projects in the northwest had led us to believe that the open trench examination yields too few data to merit the expense of keeping a team of archaeologists in the field while the trenching machines operate. Selected sections of the route might have been profitably examined, but due to other commitments this phase of the archaeological examination had to be eliminated, although one never knows what lies below the ground surface, and whenever possible the open pipeline trench should be examined.

The findings presented here, then, are largely those obtained from surface sites recorded during an extensive archaeological survey of a predetermined route. Frequently, long sections of pipeline routes in the Pacific Northwest and

in the Great Basin are found to be devoid of archaeological materials (Tuohy 1958-59; Anderson 1961). In such cases, in order to avoid being strictly confined to the narrow right-of-way, I believe that the archaeologist should obtain permission to broaden his base line. Once a pipeline and its access road are constructed, much unused or undisturbed land witnesses the imprint of modern man and all his trappings, and the opportunity for archaeological investigation may thus be impaired. Even if no archaeological sites are found, one can make other observations. Which areas were avoided or not utilized by aboriginal peoples, and why? Salvage archaeology can contribute to problem archaeology in this seemingly negative way as well as by its positive findings.

The sites reported herein might have gone unrecorded for years, and the artifacts from them might have strayed into private hands, had the liaison between archaeologists and pipeliners not been established. Largely through the efforts of Jesse L. Nusbaum, who conceived of pipeline salvage archaeology, such rapport has been established, and each new year finds are made which contribute to the total picture of man's past. As the human population literally explodes over the face of the earth, and as natural habitats change or disappear, field observations and surveys conducted by trained personnel and sponsored by private industry are recording not only evidences of man's past, but his changing present as well. While this report focuses upon the former, the latter, an equally important aspect of cultural studies, did not go unobserved.

A fragment of past days survives in the buckaroo camps of the Northern Great Basin, where one may still see mustangs and men out of the mold of the Old West. A fat "ground hog" still forms table fare for some reservation Indians, and the natural landscape, elsewhere obliterated, defaced, or controlled, appears untrammeled. Nothing is more compelling in nature than the sight of a large buck deer, at man's approach hiding his bulk behind a scrawny shrub or small boulder, holding his ground until the last moment, and then bounding his way to freedom. Equally compelling is a glimpse of a single Pronghorn, secure and frolicking among grazing cattle, or the sight of a herd of Pronghorns, now grazing, now resting, now moving rapidly with the young ones in front, like gaudy ships over a sea of sagebrush. For the opportunity to become acquainted with the Northern Great Basin and its past, I sincerely wish to thank all those persons who made this report possible and who contributed to its pages.

ACKNOWLEDGMENTS

No piece of archaeological field research may be considered complete until the results are published, and few, if any, archaeological reports may be published without the generous assistance of mentors and colleagues, professional persons in other disciplines, and the support and interest of the public at large.

To the Nevada Northern Gas Company and the El Paso Natural Gas Company, we wish to express once more our appreciation for the whole-hearted cooperation and financial support received on this project. We would like to single out for special thanks Mr. Harold Laub, President of the Nevada Northern Gas Company, and Judge Clark J. Guild, Chairman of the Board of Trustees of the Nevada State Museum, signers of the original generous contract which permitted the archaeological work to be accomplished. We also wish to express our thanks to Mr. James L. Sanders, Vice-President of Engineering and Operations for the Nevada Northern Gas Company, and Mr. Sam O'Kelly, Construction Superintendent for El Paso Natural Gas Company, for their many courtesies.

To the following individuals and the institutions they represent, we also extend our gratitude for assistance as described: the National Park Service personnel at Region Four Headquarters in San Francisco, especially Mr. Paul J. F. Schumacher, who handled the initial negotiations of the salvage contract; the Nevada State Museum for sponsorship and many other courtesies, with special thanks to Mr. James Calhoun, Director, who gave freely of his time in preparing several plates for this report, to Dr. Richard Shutler, Jr., Curator of Anthropology, who was in overall charge of the pipeline project, to Dr. Charles Rozaire, Curator of Archaeology, and to Mrs. Doris Rendall, Research Assistant; the Idaho State College Museum, Pocatello, Idaho, for aid in all

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Lastly, I would like to thank the members of my field crew, Mr. Raymond Brazzanovich and Mr. William Twitchell, whose able assistance in all phases of the field work was much appreciated, and Dr. Richard Shutler, Jr., who guided all phases of the archaeological project from its inception until its completion.

This report owes whatever merit it may have to all these people. I take the responsibility for its shortcomings.

PART I

ENVIRONMENT

PHYSIOGRAPHIC PROVINCES

That part of the arid west traversed by the Nevada Northern pipeline lies between the 39th and 43rd parallels and the 114th and 120th meridians. The route passes through parts of Idaho and Nevada, and traverses portions of two major physiographic provinces, the Columbia Plateau and the Basin and Range Province (Map 1).

Columbia Plateau

According to Fenneman (1931: 225), the Columbia Plateau has the following distinguishing characteristics: (1) it is built up of nearly horizontal sheets of lava, with a flat or rolling surface; (2) on all sides but the south the plateau abuts upon higher land; (3) the volcanic rocks underlie thin soil, a feature which contrasts with the detritus covered desert plains of the Northern Great Basin; (4) the boundary between the Columbia Plateau and the Great Basin is an arbitrary one based only upon drainage patterns; (5) rocks of the Columbia Plateau are primarily basalt lavas, acid lavas, and lake and stream deposits; (6) drainages have created narrow walled canyons everywhere except through about 50 miles of lacustrine deposits either capped or interbedded with lava flows in western and southwestern Idaho.

Altitude and degree of dissection have produced five styles of topography, subdividing the Plateau into sections, of which only the Payette Section is partially traversed by the pipeline route. In southwestern Idaho the route goes through two minor portions of the Payette Section. Near Mountain Home, Idaho, it is confined to the basalt plateau of the eastern part of the Payette subdivision. Farther south, once the Snake River is crossed, the route enters the Owyhee Uplands (Map 2). Fenneman (1931: 244) lists the distinguishing features of the Payette Section as follows: (1) its altitude is less than other portions of the Plateau; (2) lake beds underlie the surface, either immediately below or interbedded with the lava flows; (3) because of the weakness of these sedimentary rocks, the surface is partly dissected by stream valleys; (4) on both the northern and southern margins, the Payette Section rises. In the south, it rises to approximately 6000 feet above sea level, the altitude of the divide between the Snake River Basin and the internally drained Great Basin.

The Owyhee Uplands are encountered along the pipeline route about 15 miles southwest of Bruneau, Idaho. Here, the gleaming white and buff-colored sedimentary beds, capped or interbedded with dark basalt flows, yield to a deeply dissected lava plateau. These rolling dissected uplands slope downward in all directions from the Owyhee Mountains, a north-south range about thirty miles long. Granite and older eruptives are exposed along this range. The deep canyons of the Owyhee River and its tributaries are firmly entrenched in the uplands, partly due to increased rainfall and favorable slope near the mountains, and partly due to the weakness of some of the older extrusive rocks.

Basin and Range Province

The second major physiographic area, the Basin and Range Province, embraces one-tenth of the United States. Fenneman (1931: 328) divides this large area also into five sections. The province as a whole, however, is characterized by the following: (1) in the northern half drainage generally leads to enclosed basins; (2) isolated, roughly parallel, north-south trending mountain ranges, separated by basins, distinguish the region; (3) runoff is insufficient to reach the sea or to forward its load of detritus, and sub-areal waste coats the intermontane deserts in most sections; (4) fresh ground water in springs and wells is not abundant.

About 20 miles south of the Nevada-Idaho border, near the headwaters of the North Fork of the Little Humboldt River, the pipeline route crosses a divide which separates the Owyhee Uplands from the Great Basin section of the Basin and Range Physiographic province (Map

3). There is no perceptible change in landforms at this divide, however, and the basalts and other lavas continue to dominate the landscape until Paradise Valley, Nevada is reached. At this point along the pipeline route, one realizes that the Basin and Range Province has been entered. On both sides of Paradise Valley high north-south trending ranges rise above the valley floor, and fan-covered pediments are apparent along their margins. This portion of the Carson-Humboldt Basin shall be referred to as the Northern Lahontan sub-section of the Basin and Range Province. It differs but little from the "Carson-Humboldt Sink", or central area of the Lahontan Basin, except that as one travels southward along the pipeline route, shore features of Lake Lahontan and subsequent lakes become more marked, and the increased aridity of the region is reflected in the landforms and natural vegetation. Playas appear for the first time in the basins, and the pipeline route skirts adjacent mountain ranges so as to avoid areas of broken relief.

In summary, two major physiographic provinces in Idaho and Nevada are partially traversed by the Nevada Northern pipeline route, the Columbia Plateau and the Basin and Range Province. Only one major section of each province is crossed by the pipeline, the Payette Section of the Plateau, and the Great Basin Section of the Basin and Range Province (Maps 1-5). (Note: the maps do not coincide with these physiographic subdivisions.) Further division of these sections is made into the following arbitrary sub-sections or smaller physiographic units. (1) The basalt plateau between the Snake River and Mountain Home, Idaho, through which runs about 16 miles of the pipeline route, will be referred to as *Payette sub-section 1.* (2) A section of the route about 20 miles in length, from the south bank of the Snake River to a point on the pipeline route near the canyon of the Wickahoney Creek, Owyhee County, Idaho, will be called *Payette sub -section 2.* (3) *The Owyhee Uplands,* a rolling basalt plateau, deeply dissected by the Owyhee River and its tributaries, extends from the canyon of Wickahoney Creek in Owyhee County, Idaho, to the divide between the Pacific Ocean and the Great Basin drainages in northern Humboldt County, Nevada, a distance of about 100 miles. (4) The Northern portion of the Carson-Humboldt Basin, or the *Northern Lahontan Basin subsection* of the Great Basin province, extends from Paradise Valley, Humboldt County, Nevada, to a point about 10 miles north of Lovelock, Pershing County, Nevada, a distance of about 100 miles. (5) The *central portion of the Carson-Humboldt Basin* from a point about 10 miles north of Lovelock to a divide between the Carson-Humboldt Basin and the Granite Spring, Basin, near Ragged Top Peak, Churchill County, Nevada, a distance of about 30 miles. (6) The remaining portion of the route which cuts across portions of the *Granite Springs and Truckee Basins* and the mountains flanking them covers a distance of roughly 80 miles.

CLIMATE

In high-latitude deserts the world over, the prevailing weather and the resultant climatic type are similar. In the northern Great Basin along the pipeline route, there are slight local variations in weather and climate, and these should be made clear, for such factors directly affect the web of life of which man forms but a single link. The amount of precipitation—rain, sleet, hail and snow—and the degree of heat or cold present in a given area are perhaps the most important factors in this regard. One of the distinguishing features of both the Great Basin and, to a lesser extent, the Columbia Plateau, is the vertical variation in precipitation rates and temperature ranges found on the mountain ranges. As one ascends them, the amount of average annual precipitation increases, and the range of diurnal and seasonal temperatures decreases. These factors create vertical bands or life zones which favor some species over others and which therefore support different floral and faunal assemblages. The route the pipeline takes, however, is one that tries to avoid rugged relief as much as possible, and hence, it is one that avoids variations in life zones created on the mountains by weather and climate.

The average annual rainfall for different sections of the pipeline route varies considerably, although nowhere is it in excess of 15 inches per annum. The average annual precipitation rate for Payette sub-sections 1 and 2 is from 5 to 10 inches. For the Owyhee Uplands, the average goes up to 10 to 15 inches. Near Paradise Valley, Nevada, in the northern La-

hontan Basin sub-section, the average drops back to from 5 to 10 inches. In the vicinity of Lovelock, including portions of the Carson-Humboldt and Granite Springs Basins, the average drops again from 0 to 5 inches. A final rise of 5 to 10 inches occurs near the eastern margin of the Truckee Basin, at the terminus of the pipeline near Reno.

While average annual precipitation rates roughly indicate the total amount of moisture available, they do not express daily fluctuations in temperature or other associated weather phenomena, and seasonal variations in these phenomena. The entire length of the pipeline route lies in the "rain shadow" of the Sierra Nevada and Cascade Ranges to the west. Frontal systems, born off the Aleutian Islands, generally expend most of their energy west of these mountains. Boise, Idaho, near the northern terminus of the pipeline, averages 90 days of precipitation per year, with the maximum in winter months—November, December, January, and February. Reno, Nevada, the southern terminus, also has a winter maximum, with August the driest month. The Owyhee Uplands, one sub-section of the route, does receive some orographic precipitation during summer, but it, too, receives most precipitation in the winter (Larrison 1957: 13-32).

Temperature ranges also affect desert life, and a comparison of the mean daily maximum ranges in Boise and Reno shows them to be quite similar. July is the hottest month in both places with the mean daily maximum 90° F. in Boise, and 88° F. in Reno. January is the coldest month in both places, the mean daily minimum 19° F. in Boise, and 20° F. in Reno. Of course, there are diurnal fluctuations which may send thermometers over 100° F. in summer and under 20° F. in winter. As Meigs (1957: 22) points out, however, three factors help make summers bearable. First, the relative humidity is very low during the hot part of the day. Second, the breeze is strongest during the afternoon. Third, nights cool off rapidly.

In summary, the pipeline route lies entirely within the northern Great Basin and southern Columbia Plateau, a region of high-latitude steppe and desert with accompanying hot, dry summers and occasionally wet, cool winters. As in most desert country, rainfall can be characterized as "fitful", now in oversupply in one can spot for a few hours or days, now absent for months, even years. There are great diurnal and seasonal fluctuations in temperatures and these are the rule, not exceptions. There are also mountain ranges in the Great Basin that the pipeline route avoids, and these ranges exhibit floral and faunal assemblages which depend upon more moist conditions generally found at higher elevations.

LIFE ZONES

Another frame of reference useful in reporting archaeological finds is that of the life zone, a widely used biological concept which relates biota to particular environmental surroundings. As such, it is applicable to studies of environmental archaeology. While archaeologists generally list species of organisms useful to man, the life-zone concept permits the archaeologist to tie those assemblages of organisms to a particular environment.

With the exception of portions of the Carson-Humboldt Basin, which are Lower Sonoran in character, the entire length of the pipeline route lies within the Upper Sonoran Life Zone, a sagebrush belt covering large portions of southwestern Idaho and northern Nevada. Although several other species of sagebrush are present, *Artemisia tridentata* is the dominant plant. In some places, particularly in the Owyhee Uplands, *Artemisia* shrubs form dense stands from two to seven feet high.

Davis (1939), reporting on the fauna of Idaho, states that the arid plateaus of southwestern Idaho lie wholly within an area which he terms "The Northern Great Basin Biotic Area". Davis characterizes the province as follows (1939: 33-34): "The dominant vegetation of the area is xerophytic, consisting of several species of sagebrush *(Artemisia)* which, in favorable uncultivated regions form pure dense stands. Associated with *Artemisia Tridentata* are salt sage, small salt sage, hop sage, rabbit brush, two species of juniper and, in the foothills, mountain mahogany. Several kinds of birds are thought to be restricted to the area in breeding season. Among them are: Sage hen *(Centrocercus urophasianus)*, Nevada red-winged Blackbird *(Agelaius phoeniceus nevadensis)*, Brewer blackbird *(Euphagus cyanocephalus cyanocephalus)*,

Nevada loggerhead shrike *(Lanius Ludovicianus nevadensis)*, Nevada sage sparrow *(Amphispiza belli nevadensis)*, Brewer sparrow *(Spizella breweri breweri)*, American raven *(Corvus corax sinuatus)*, and green-tailed Towhee *(Oberholsera chlorura)*.

Mammals typical of the area are: Western canyon bat, Snake River Valley raccoon, little spotted skunk, Nevada long-eared desert fox, Nevada mottled ground squirrel, Great Basin chipmunk, Townsend pocket gopher, Idaho pocket mouse, Columbia kangaroo rat, short-tailed grasshopper mouse, canyon mouse, Nevada wood rat, and desert black-tailed jack rabbit."

For the remainder of the pipeline route in Nevada, Hall (1946) is the best source. He states (Hall 1946: 33-34) that much of central and northern Nevada, like portions of southwest Idaho, are covered with *Artemisia,* or some variety of it, and that the least chipmunk and sagebrush vole are two mammals whose distribution seemingly is determined by that vegetation. Hall (1946: 34) goes on to say: "In the lower parts of the valleys and on other soils that have a high content of alkali, *Artemisia tridentata* gives way to *Chrysothamnus, Sarcobatus, Atriplex,* and other plants able to live under adverse conditions. These plants, with the exception of *Artemisia tridentata*, usually occur in the bottoms of the valleys. Therefore, in general, these plants occur at lower elevations than *Artemisia tridentata.* If the area which supports *Artemisia tridentata* and the area of salt-desert which supports *Sarcobatus vermiculatus, Atriplex confertifolia, Chrysothamnus, Tetradymia, and Gutierrezia* be considered as one belt, several species of mammals can be pointed to as largely confined to this belt. In addition to the sagebrush chipmunk and the sagebrush vole, in this category there are the following: Townsend ground squirrel, long-tailed pocket mouse, two species of *Microdipodops,* Ord kangaroo rat, northern grasshopper mouse, and pigmy rabbit."

One of the interesting observations that Hall (1946: 37) makes is that the Upper Sonoran Life Zone is not only the most extensive area in Nevada, but that it has the largest number of species, 83. Organisms which are useful as indicators of the Upper Sonoran are:

"*Sorex merriami,* Merriam shrew
Myotis subulatus, small-footed myotis
Citellus townsendii,
Townsend ground squirrel
Eutamias minimus, least chipmunk
Eutamias panamintus, Panamint chipmunk
Eutamias dorsalis, cliff chipmunk
Perognatus parvus, long-tailed pocket mouse
Microdipodops megacephalus,
dark kangaroo mouse
Microdipodops pallidus,
pallid kangaroo mouse
Dipodomys ordii, Ord kangaroo rat
Onychomys leucogaster,
northern grasshopper mouse
Sylvilagus idahoensis, pigmy rabbit"

From the foregoing descriptions, it may be readily understood that the main attraction of the Upper Sonoran Life Zone to humans, quite apart from the vegetable foods, which have not been emphasized here, but which occur in the Sonoran Life-zones, was, in Medithermal times at least, the availability of small mammals. In addition to the above listed species of small mammals, antelope *(Antilocapra americana)*, deer *(Odocoileus)*, and mountain sheep *(Ovis canadensis)*, probably were taken in portions of the Owyhee Uplands. Large predatory animals such as coyotes, bobcats, and mountain lions were rarely taken, and then not as foodstuff (Steward 1938: 34-37).

One other source of animal protein cannot be overlooked—the resources of the rivers, streams, and nearby lakes. The Snake River and its tributaries in southwestern Idaho below Shoshone Falls are renowned for their annual salmon runs. In addition, archaeological sites in that area invariably contain much river mussel shell. The Humboldt River in Nevada, twice crossed by the pipeline route, also contains several species of fish, eight of which were important to the historic native peoples (Steward 1938:41). Likewise, river mussel shells are very much in evidence at archaeological sites along this river, (Pl. 34), although it is not known whether or not these mollusks were in sufficient supply to constitute a food source (Loud 1929: 157).

In summary, the Upper Sonoran Life Zone and its biota might be adjudged a "harsh" environment by modern standards. On the other hand, it is known that the native peoples, equipped with an intimate knowledge of that

biota and the tools with which to exploit these natural resources, succeeded in sustaining themselves for generation after generation. While it is true that any rupture in the web of life caused by natural factors might tend to limit the human population, nevertheless the Upper Sonoran Life Zone, in Medithermal times, or from 2000 B. C. to the present, must have provided many of the necessities for human survival, including seeds, bulbs, roots, small mammals, fish, shellfish, birds, waterfowl, some large game animals, and vegetable fibers for shelters, utensils and containers, to mention a few.

If the reader desires a fuller account of the natural resources and the ways in which these resources were utilized by native peoples of the Northern Great Basin, he is referred to Julian H. Steward's (1938) classic monograph, "Basin-Plateau Aboriginal Sociopolitical Groups". This and other references cited have been used to describe the natural environment found along the pipeline route.

Some informal personal observations will conclude this portrayal of the environment. The spring of 1962 was a wet one in the northern Great Basin. Rains persisted through most of May, but abated by the first of June, and the landscape came alive with wild flowers. As might be expected, the late spring and early summer was a very active time for the fauna of the region, and the survey crew quite unexpectedly came upon a number of animals in their natural habitat.

With the exception of jackrabbits and cottontails which were observed all along the pipeline route, most of the animals were seen in the Owyhee Uplands of Idaho. Small mammals most often encountered, other than rabbits, were chipmunks. Also observed were ground squirrels and marmots. Some large mammals were also seen. Deer seemed to favor the deep canyon lands of the Owyhee River and the mountain mahogany-covered "breaks" in the rim rock above the canyons. Antelope were quite numerous also, although the herd present in the Owyhee Uplands was recently reintroduced into that region (Idaho Fish and Game Department, personal communication). Predators were rarely seen in the daytime, but at dusk a coyote, a wild dog, or a bobcat occasionally was observed. Despite repeated warnings from local residents that the sagebrush was alive with rattlesnakes, only four or five of these much dreaded reptiles were encountered. Of the other reptiles, lizards seemed ubiquitous. Birds most often encountered in the Owyhee Uplands were sage grouse and their offspring.

PART II

ETHNOLOGICAL BACKGROUND

NATIVE GROUPS

Native groups known to have used the territory through which the pipeline passes belong to the Northern Paiute and the Western Shoshoni, two major groupings which are themselves related in culture and language (Steward 1938). With the exception of about six miles of the pipeline route in Washoe County, Nevada, which was utilized by the Hokan-speaking Washo, most of the pipeline route in Nevada is in territory formerly utilized by Northern Paiute groups centered along the Humboldt River and its tributaries. In Idaho, the Owyhee Uplands were apparently utilized as summer hunting grounds by both the Northern Paiute and the various Shoshoni groups centered around the middle Snake River and its tributaries. Not far to the east of the pipeline route in Nevada lies the territory of the Nevada Shoshoni.

Linguistic and cultural boundaries must be somewhat arbitrary in this area. Stewart (1941, Map 1) draws his northeastern boundary between the Shoshoni and the Northern Paiute diagonally through the heart of Owyhee County, along a line which approximates the route of the pipeline. Steward's northeastern boundary between the two groups tends to take a more northerly direction (1938, Fig. 1). However the boundary line is drawn through Owyhee County, it seems clear that once the Nevada border is reached in the vicinity of the 117th meridian west of Greenwich, and that once the upper reaches of the North Fork of the Little Humboldt River are approached, one is in territory usually assigned to the Northern Paiute of Nevada.

The question of which specific native groups utilized what parts of the pipeline area in Idaho during early historic times is still an open one. The ethnographic evidence indicates that in early contact times there were no precisely defined enclaves of native peoples occupying specific territories in this area, but rather loose agglomerations exploiting seasonal resources. Murphy and Murphy (1960: 319-322) examined the questions of tribal and linguistic boundaries, and utilization of southwestern Idaho by native groups. They came to the conclusion that: "There were no boundaries, as such, in southwest Idaho".

The task of reconstructing the picture of native use of this territory has been complicated by the fact that whites first contacting the native groups were not aware of the nomadic habits of the Indians, and confused designations resulted. Murphy and Murphy (1960: 319-322) point out that some portions of the large middle Snake River area were used little, if at all, and that there were only a few Shoshoni groups who wintered there. Apparently, Indians from adjacent regions congregated seasonally along the middle Snake River, attracted by two sources of food. West of Shoshoni Falls, an impenetrable barrier to migratory salmon, fishing was an extremely important economic pursuit. A second desirable resource was camas bulbs from the rich camas grounds to the north of the river. Shoshonean and Northern Paiute populations from all adjacent areas were drawn to these locations. Early trappers, explorers and travelers often mistakenly assumed that Indians from these diverse groups were members of a single tribe. Many confusing terms such as "Snakes", "Diggers" and "Shoshonees" have been indiscriminately applied to groups in southwestern Idaho which have no cultural, political or linguistic unity.

Snake River Shoshoni

Some of the characteristics of the Snake River Shoshoni have been described by Murphy and Murphy (1960: 321). "The Shoshone of the middle Snake River resemble the Nevada Shoshone in social, political, and economic characteristics more than does any other part of the Idaho population, and Steward (1938) lists them with the Western Shoshone for this reason. They had few horses and took no part in the buffalo-hunting activities of their neighbors of the Fort Hall plains, and warfare was virtually non-existent. Property in natural resources

was absent, and other Shoshone and the Bannock availed themselves freely of the fishing sites on the Snake River without interference or resentment on the part of the local population."

Other distinguishing cultural features of these people are discussed by Murphy and Murphy (1960: 321-322). In winter, they split into a number of scattered and very small winter camps. There were no band chiefs, nor did the winter villages have headmen. Winter camps consisted of two or three lodges, sometimes occupied by kinsmen, sometimes not, and these camps were commonly located on Snake River bottom land where there was fuel and shelter, and where salmon could be taken in spring, summer, and fall. Fish were taken in dams, with nets, weirs, hooks or spears. They were preserved by drying. The basic social unit was the family, and the village was the basic political unit. Intervillage marriage and dances acted to ally villages, but these occurrences were so infrequent that no real group unity was achieved. Each summer, these people participated in root gathering and festivities on Camas Prairie. In the fall, they made occasional forays to both the north and south to take deer, elk, and bighorn sheep.

Northern Paiute

The same lack of hard and fast tribal and linguistic boundaries which characterizes the Shoshonean groups of the middle Snake River also applies to the Northern Paiute groups of central and northern Nevada. However, the central features of their culture can be sketched. They relied upon seasonal vegetable foods, the taking of game, and the collecting of edibles wherever and whenever available. A distinguishing feature of the Northern Paiute is their adaptation to and utilization of the resources of the few lakes and streams still present in the northern Great Basin. As Stewart puts it (1941: 361): "Contrary to what might be expected in such a desert region, fish and waterfowl were an extremely important dietary item for nearly all groups."

There seems to be little in the material culture of the Northern Paiute of Nevada which would set them apart from their neighbors to the north and east, outside of a shift in emphasis toward the resources of stream and lake, and an apparent lack of pottery.

MATERIAL CULTURE

It is clear that both the Shoshoni of the middle Snake River and the Northern Paiute of northern Nevada and southwestern Oregon were basically Basin peoples with cultures oriented toward exploitation of the natural environment for subsistence purposes. Both followed a seasonal cycle searching for food. Sometimes this search brought them into contact with neighboring groups. Material culture was that of a generalized Great Basin type. Dwellings were always rather simple affairs made of bent wooden poles covered with grass tule or brush, or roofless semicircular brush shelters. Flat slab metates and oval manos and mullers, together with mortars and pestles, were used to prepare the vegetable foods which formed a large part of their diet. Containers were largely baskets, and were used for such purposes as carrying containers, storage vessels, seedbeaters, winnowing trays, and fishing devices. Pottery vessels were made by the Snake River Shoshoni, but they apparently were not made by the Northern Paiute of Nevada. Rabbit skin blankets and blankets woven of sagebrush bark were worn in winter. Moccasins were also worn, but not invariably. Small mammals were hunted with sinew-backed bows and arrows with hardened wood points. Stone-tipped composite arrows were used to take large game. Some arrow points were poisoned. Communal antelope and rabbit hunts were common. The taking of ducks and mud hens by the Northern Paiute was also a communal enterprise, as was the taking of fish by that group and by the Snake River Shoshoni (Lowie 1924; Gruhn 1961a).

LINGUISTIC CONSIDERATIONS

The historic native peoples of southwestern Idaho and northern and central Nevada spoke related dialects of a larger linguistic division called Plateau Shoshonean or Numian, a group of related languages widespread in the western basins and plateaus. Plateau Shoshonean or Numian languages from various parts of the Great Basin, along with Hopi and a few languages in north-central California, are usually classified as the Shoshonean branch of the Uto-Aztecan family of languages. Speakers of Uto-Aztecan languages ranged all the way from

Wyoming in the north to Guatemala in the south, generally occupying arid highlands.

In southwestern Idaho, two sub-groups or dialects of Plateau Shoshonean, Shoshoni and Northern Paiute, were spoken. Their geographic distribution overlaps somewhat, and it is believed that the Shoshoni language reached the Snake River before Northern Paiute, although both arrived in Idaho much later than the Sahaptin languages to the north.

The linguistic evidence is such, and the distribution of Shoshoni and Northern Paiute dialects is such, that it is postulated that a parent language of each was once spoken in the southwestern corner of the Great Basin in California and southern Nevada. It is further postulated that the differentiation of Shoshoneans into their present linguistic divisions may have taken place within the last thousand years. Deep-reaching dialect differences between Shoshoni and Northern Paiute have not developed, probably because the mobility of the semino-madic groups kept them in constant contact with one another (Paraphrased from Liljeblad 1957: 20-22).

In summary, the historic native peoples who might have exploited or utilized portions of the pipeline route are the linguistically and culturally related middle Snake River Shoshoni of Idaho and the Northern Paiute of central and northern Nevada.

PART III

ARCHAEOLOGICAL BACKGROUND

NEVADA

Pioneering archaeological investigations in Nevada were initiated four decades ago. Grosscup's bibliography of Nevada archaeology (1957) reviews previous work, and points out where the lacunae in archaeological knowledge exist. Grosscup states (1957: 4) that most of the archaeological work in Nevada has been concentrated in two areas, the southeastern and west-central portions of the state. Many cave excavations in west-central Nevada have yielded a wealth of data. Two institutions, the Southwest Museum and the University of Californa at Berkeley, were the sponsoring institutions of most of the research. Numerous publications in the University of California anthropological series deal with Nevada archaeology. In recent years, the Nevada State Museum also had conducted researches in west-central and northern Nevada and publications of results is forthcoming in the Museum's "Anthropological Papers". For a thorough review of most of the publications dealing with Nevada archaeology, the reader is referred to Grosscup's (1957) bibliography.

One of the needs in Nevada archaeology that Grosscup (1957: 5) underscores is that for more survey work, particularly in a broad transverse band running from the Oregon-Idaho border to southern California. The survey of the Nevada Northern pipeline meets part of this need.

Some recent archaeological investigations have been made in northern Nevada (Shutler and Shutler n.d.; Baumhoff n.d.), but the results are not yet published, and there is a pressing need for more stratigraphic excavations to be carried out in northern Nevada.

IDAHO

After a long period of dormancy, archaeology came to life in Idaho in the late 1950's. Since 1957, when a University of Idaho crew under Alfred Bowers carried out an excavation at Brown's Bench in south-central Idaho, and the following year, when an Idaho State College Museum crew, under the direction of Earl H. Swanson, surveyed much of southern and central Idaho, rapid strides have been made. Although major excavation efforts have been directed at Birch Creek Valley in eastern Idaho (Swanson 1961) and Wilson Butte, on the Snake River Plain (Gruhn 1961a), survey work and limited testing of sites are carried out each year in all parts of the state (Gruhn 1961b; Osmundson and Hulse 1962).

Because of their key location with respect to known "Plateau" and "Basin" cultures, archaeological sites in southwestern Idaho have received some attention (Swanson, Tuohy, and Bryan 1959; Swanson, Bryan, and Powers n.d; Tuohy and Swanson 1960; Gruhn 1961a; Bowers and Savage 1962), but archaeological work in that area is still in its initial fact-finding phase. With the exception of two short papers which describe projectile point types from western and southwestern Idaho (Caywood 1948; Kehoe 1955), the above papers are the only ones presenting results of archaeological work in southwestern Idaho. Particularly in the ecologically distinctive Owyhee Uplands region, there is need for excavation.

SUMMARY

Throughout the northeastern Great Basin, only a handful of stratified sites have been excavated, and only the barest outline of northeastern Great Basin and southern Columbia Plateau prehistory has emerged. The regional cultures show some diversity, though in general the findings accord with general expectations based upon archaeological work elsewhere in the intermontane west. The problem remains of defining the prehistoric cultures and placing them chronologically.

Of particular importance to the definition of aboriginal cultures in southwestern Idaho and northern Nevada, when published, will be Swanson, Bryan, and Powers' survey paper

(n.d.), Shutler and Shutler's excavation report of Deer Creek Cave in Elko County, Nevada (n.d.), and Baumhoff's report (n.d.). When these works can be considered along with the data from this pipeline survey report, we may then be in a position to choose specific areas and sites in southwestern Idaho and the northern Great Basin for further investigation.

PART IV

SITES

DESIGNATION

It was decided that a location yielding more than a single projectile point would be called a "site". A point found by itself would be considered an isolated find, while a single point accompanied by several waste flakes would be recorded as a "site".

Along the right-of-way, the system employed to designate sites was that cultural remains or indications collected on the path of the pipeline were simply given the number of the nearest engineering station. Sites found off the right-of-way could not be so simply handled, since many sites had previously been recorded in the several Idaho and Nevada counties. Temporary numbers in serial order with the name of the county as a prefix were used as site designators.

Permanent numbers were assigned to the sites at the conclusion of the field work, following the Smithsonian system. In this system three symbols are utilized. The first is a numeral which denotes the alphabetical position of the state in question. Thus, Idaho's prefix is 10, and Nevada's is 26. The second symbol is an abbreviation of the county in which a site is located; however, Elko County, Nevada, is not abbreviated on maps but is abbreviated "Elk" in text. For example, Oe., is the abbreviation for Owyhee County, Idaho, and Hu., the abbreviation for Humboldt County, Nevada. The third symbol is another numeral which represents the numerical listings of each site within the county (Maps 2-5).

DISTRIBUTION

As can be seen from an examination of the maps (2-5), there are some gaps in the distribution of archaeological sites, not only on the pipeline route, but in areas immediately adjacent to it. In contradistinction to the Owyhee Uplands, which show considerable aboriginal use, the areas traversed by the pipeline in the southern portion of the Carson-Humboldt Basin, Granite Springs Basin, and Truckee Basin contain very few sites and little evidence of aboriginal use or occupancy. Perhaps the dearth of archaeological materials can be explained by the nature of the terrain the pipeline crosses in those areas. In all of the above mentioned basins, the route traverses rather barren rugged mountains and dry basins where springs are scarce and where human subsistence possibilities are limited. This does not, of course, apply to the basins in their entirety, but merely to those portions of them lying on the path of the pipeline. The relative abundance of archaeological sites elsewhere in these basins of west-central Nevada is well known.

Portions of the Owyhee Uplands show considerable aboriginal use, probably due to the area's potential for human subsistence, especially the seasonal abundance of plant foods and small game during Medithermal time (about 2000 B. C. to the present), and perhaps to the availability of large game in earlier Late Pleistocene and Post-glacial periods. After a wet winter, such as that of 1961-62, the Owyhee Uplands appear verdant. It is likely that during favorable Late Pleistocene and Post-glacial periods, the area offered a varied and attractive biota for man's use.

TYPES

The 113 sites recorded on and near the Nevada Northern Pipeline have been grouped into four major categories or types: (1) camp sites, (2) chipping areas, (3) rock shelters and (4) petroglyph sites. In setting up these four categories many somewhat arbitrary decisions were made. For example, a small camp located near a rock shelter with petroglyphs nearby was placed in all three categories. However, because of the the primary division between camps and chipping areas, an open camp site also showing much use as a chipping station was considered primarily a camp and was so classified. The first two types of sites were further divided into seven sub-types on the basis of nearby natural features of the terrain, as follows:

a. In dunes
b. In dunes next to large rivers

c. At breaks in the rim rock
d. Along small intermittent drainages
e. Along terraces
f. Near springs
g. Near other features (to account for location on buttes or promontories or other features.)

The recorded camps are fairly equally distributed among the several types. It would seem that in both Idaho and Nevada camp sites were chosen because of proximity to water and to food resources. Dune areas next to intermittent drainages or large rivers were often selected as camp sites. At these locations food preparation tools were often found. Perhaps such tools indicate that larger social groups, such as a family or several families, utilized the area. The same may said for sites recorded near natural springs, while those camps located at breaks in the rim rock, along terraces, or near other features, more often than not were smaller camps, possibly those of hunting parties rather than family camps.

Chipping areas of all the above sub-types were found, but nearly half of them were located near small intermittent drainages. Another favored location for chipping stations was an area at or near a break in the rim rock. Gravels, bearing nodules of ignimbrite, obsidian,and other materials suitable for the manufacture of chipped stone tools, often were exposed near breaks in the rim rock or along small drainages, and perhaps this accounts for the high percentage of chipping sites recorded at such locations.

Rock shelters, the third type of site, show considerable variety. A few are very small, with room for no more than three or four persons, while others are large and capable of providing shelter for an extended family or group of families. Southwestern Owyhee County in Idaho and north-central Humboldt County in Nevada appeared to have a number of rock shelters which could be expected to yield well if excavated. None of the recorded shelters lay in the path of construction.

Petroglyph sites exhibit some variability, but most are smooth surfaced rock outcroppings on which pecked designs were executed. Not one painted petroglyph was recorded during the course of the survey. The petroglyphs usually occurred in panels with more than one design element present, but not always. Two sites near Paradise Valley, Nevada contained large panels completely covered with petroglyphs and other surfaces which contained only one or two design elements. Single pecked petroglyphs were recorded near a water hole, on the rear wall of a small shelter, and scattered around the base of a butte. A further discussion of petroglyph sites will be presented later in this report.

In summary, of the 113 archaeological sites recorded on or near the pipeline, 65 of the total were classified as chipping areas, 39 were camp sites, 14 were rock shelters, and 9 were petroglyph sites. (Note: the total of these is greater than 113, as several sites were listed in more than one category.) From this it might be conjectured that the pattern of aboriginal occupation present in the northern Great Basin, as revealed by a survey along a linear route, is essentially that of the historic native peoples, that is, one of meager material culture remains left by hunting and foraging groups practicing economic activities on a bare subsistence level. Since neither the Northern Paiute nor the Shoshoni, by their own testimony, made petroglyphs (Heizer and Baumhoff 1962: 206), sites bearing them can be attributed to the prehistoric peoples of these regions.

LIST OF SITES

The first column in the following site list contains the permanent numbers assigned to the archaeological locations. Numerals occurring in the first column other than the Smithsonian site designators represent station numbers of the engineering survey. These were given to archaeological materials which were not assigned to a site. The second column contains a list of numerals indicating the previously described type and sub-type of site represented (see p. 21). The third column contains a listing of the physiographic sub-section of the pipeline route in which the site is located (see p. 10). The last column is a partial listing of the materials collected or observed at each site.

SITE AND FIND LIST (IDAHO)

Site No.	Description (Type)	Physiographic Sub-section	Catalogue entries, and Materials Collected
10-El-50	1d	Payette-1	Proj. points, mussel shell fragments; 4 entries
10-El-51	2d	Payette-1	Proj. point, waste flakes; 1 entry
10-El-52	2d	Payette-1	Ignimbrite nodules and waste flakes; 4 entries
10-El-53	3c	Payette-1	Proj. points, waste flakes, animal bones; 9 entries
10-El-54	1a, d	Payette-1	Proj. point, waste flakes; 2 entries
10-El-55	2e	Payette-1	Proj. points, waste flakes; 4 entries
10-El-56	1b	Payette-1	Proj. points, mortars, pestles, metates, manos, Shoshoni ware pottery, scrapers, mammal bones, mussel shells, etc.; 80 entries
10-El-57	1c	Payette-1	Proj. point, waste flakes, other stone tools; 4 entries
10-El-58	1a, d	Payette-1	Proj. points, mortars, manos, Shoshoni ware pottery, mussel shell frags., animal bones, contact or trade goods, or modern debris; 27 entries
10-El-59	3	Payette-1	Waste flakes; 1 entry
10-El-60	3	Payette-1	Proj. point, mussel shells, 2 entries
10-El-61	1b	Payette-1	Proj. points, waste flakes, river mussel shells, 3 entries
10-El-62	1b, e	Payette-1	Proj. points, waste flakes, mortar, rubbing stone, Shoshoni ware pottery, animal bones, mussel shells; 12 entries
10-Oe-135	2d	Payette-2	Proj. point, waste flakes; 2 entries
10-Oe-136	2d	Payette-2	Proj. point, waste flakes; 2 entries
10-Oe-137	1f	Payette-2	Proj. points, manos, metates, Shoshoni ware pottery, scrapers; 7 entries
10-Oe-138	2d	Payette-2	Paleontological locality with waste flakes nearby; 10 entries
1725-1750	2c	Payette-2	Waste flakes; 1 entry
10-Oe-139	1e	Payette-2	Proj. points, waste flakes, metates; 8 entries
10-Oe-140	1d	Payette-2	Proj. points, waste flakes, metates; 13 entries
1942		Owyhee Uplands	Obsidian waste flake; 1 entry
10-Oe-141	2c	Owyhee Uplands	Proj. points, waste flakes, modern debris; 23 entries
10-Oe-142	2c	Owyhee Uplands	Proj. points, waste flakes; 17 entries
2798		Owyhee Uplands	Waste flakes; 2 entries
10-Oe-143	2c	Owyhee Uplands	Proj. points, waste flakes; 6 entries
10-Oe-144	2f	Owyhee Uplands	Proj. points, waste flakes; 4 entries
10-Oe-145	1d	Owyhee Uplands	Proj. points, metates, manos, Shoshoni ware pottery (Riddle Textile Impressed variety), brass ornament, musket barrel, animal bone, etc.; 157 entries
10-Oe-146	4	Owyhee Uplands	Pecked petroglyph site, a few waste flakes; 1 entry
10-Oe-147	2c	Owyhee Uplands	Proj. point, waste flakes; 2 entries
3658		Owyhee Uplands	Waste flake, ruminant teeth fragment; 1 entry
10-Oe-148	2d	Owyhee Uplands	Proj. points, waste flakes; 12 entries
10-Oe-149	2c, 3, 4	Owyhee Uplands	Proj. points, waste flakes, animal bones, one pecked petroglyph; 18 entries
10-Oe-150	2d	Owyhee Uplands	Proj. point, waste flakes; 3 entries
10-Oe-151	1c	Owyhee Uplands	Proj. points, misc. stone tools; 6 entries
10-Oe-152	2d	Owyhee Uplands	Waste flakes, misc. stone tools; 2 entries
10-Oe-153	1d	Owyhee Uplands	Proj. points, misc. stone tools, river mussel shells; 5 entries
10-Oe-154	2d	Owyhee Uplands	Waste flakes, blade fragment; 2 entries
10-Oe-155	2b	Owyhee Uplands	Proj. point, waste flakes, misc. stone tools; 5 entries
10-Oe-156	1d, e, f, 4	Owyhee Uplands	Proj. points, misc. stone tools, one pecked petroglyph; 33 entries
10-Oe-157	2d	Owyhee Uplands	Waste flakes, misc. stone tools; 8 entries
10-Oe-158	2c	Owyhee Uplands	Proj. point, waste flakes; 3 entries
10-Oe-159	2d	Owyhee Uplands	Proj. point, waste flakes; 2 entries
10-Oe-160	2f	Owyhee Uplands	Waste flakes; 1 entry
10-Oe-161	2d	Owyhee Uplands	Waste flakes; 1 entry
10-Oe-162	1d, f	Owyhee Uplands	Proj. points, metates, manos, Shoshoni ware pottery, misc. stone tools; 7 entries
10-Oe-163	3, 4	Owyhee Uplands	Small shelters with pecked petroglyphs nearby. No collection.
10-Oe-164	1a, d	Owyhee Uplands	Proj. point, misc. stone tools; 7 entries

SITE AND FIND LIST (IDAHO) (Continued)

Site No.	Description (Type)	Physiographic Sub-section	Catalogue entries, and Materials Collected
10-Oe-165	1d	Owyhee Uplands	Proj. points, pestle, misc. stone tools; 5 entries
10-Oe-166	1f	Owyhee Uplands	Waste flakes, misc. stone tools, modern debris; 7 entries
10-Oe-167	1f	Owyhee Uplands	Proj. points, bedrock mortars, metates, Shoshoni ware pottery, misc. stone tools, trade goods; 32 entries
10-Oe-168	1c, 4	Owyhee Uplands	Proj. points, misc. stone tools, pecked petroglyphs; 13 entries
10-Oe-169	1g, 2g, 4	Owyhee Uplands	Proj. points, misc. stone tools, pecked petroglyphs, circular stone structures; 68 entries
10-Oe-170	1c, 4	Owyhee Uplands	Proj. points, misc. stone tools, pecked petroglyphs; 66 entries
10-Oe-171	1g, 2g	Owyhee Uplands	Proj. points, pestle, misc. stone tools, circular stone structures; 90 entries
10-Oe-172	1c	Owyhee Uplands	Proj. points, misc. stone tools, contact goods, metate fragment; 25 entries

SITE AND FIND LIST (NEVADA)

Site No.	Description (Type)	Physiographic Sub-section	Catalogue entries, and Materials Collected
26-El-26	2f	Owyhee Uplands	Proj. point, waste flakes, misc. stone tools; 8 entries
26-El-27	2f	Owyhee Uplands	Proj. points, waste flakes, misc. stone tools, 17 entries
26-El-28	2d, e	Owyhee Uplands	Proj. point, waste flakes, misc. stone tools; 5 entries
26-El-29	1d, e	Owyhee Uplands	Proj. points, waste flakes, misc. stone tools; 22 entries
26-El-30	3	Owyhee Uplands	No collection
26-El-31	2c	Owyhee Uplands	Waste flakes, misc. stone tools; 7 entries
26-El-32	3	Owyhee Uplands	Proj. points, misc. stone tools, mussel shells; 13 entries
26-El-33	3	Owyhee Uplands	No collection
26-El-34	3	Owyhee Uplands	Proj. point; 1 entry
26-El-35	1e	Owyhee Uplands	Mortar, waste flakes; 2 entries
26-El-36	2e	Owyhee Uplands	Anvil stone, waste flakes; 3 entries
26-El-37	2c	Owyhee Uplands	Proj. point, waste flakes, stone tools; 2 entries
26-El-38	1f	Owyhee Uplands	Proj. points, waste flakes; 7 entries
26-El-39	2d	Owyhee Uplands	Proj. point, misc. stone tools; 19 entries
26-El-40	2d	Owyhee Uplands	Proj. point, waste flakes, misc. stone tools; 14 entries
26-El-41	2d	Owyhee Uplands	Proj. points, waste flakes; 3 entries
900		Owyhee Uplands	Nodules of minerals and fine grained rock suitable for chipped stone tools.
26-Hu-16	2d	Owyhee Uplands	Proj. points, waste flakes; 2 entries
26-Hu-17	1e, 2e	No. Lahontan Basin	Proj. points, misc. stone tools; 136 entries
26-Hu-18	2c	No. Lahontan Basin	Proj. points, waste flakes, misc. stone tools; 28 entries
26-Hu-19	2d, e	No. Lahontan Basin	Proj. points, waste flakes, misc. stone tools; 108 entries
26-Hu-20	1g	No. Lahontan Basin	No collection. Wickiup?
26-Hu-21	1c, d, g, 2d	No. Lahontan Basin	Proj. points, waste flakes, misc. stone tools, circular depressions; 99 entries
26-Hu-22	2d	No. Lahontan Basin	Proj. point, waste flakes, misc. stone tools; 5 entries
26-Hu-23	2e	No. Lahontan Basin	Obsidian nodules and waste flakes
26-Hu-24	2d	No. Lahontan Basin	Waste flakes; 1 entry
26-Hu-25	2d	No. Lahontan Basin	Proj. point, waste flakes; 4 entries
26-Hu-26	2e	No. Lahontan Basin	Proj. points, waste flakes, misc. stone tools; 11 entries
26-Hu-27	2e	No. Lahontan Basin	Obsidian nodules and waste flakes; 2 entries
26-Hu-28	2d	No. Lahontan Basin	Waste flakes; 2 entries
28-Hu-29	2d	No. Lahontan Basin	Waste flakes, blue bead, stone tools; 3 entries
28-Hu-30	2d	No. Lahontan Basin	Proj. points, waste flakes, misc. stone tools; 6 entries
28-Hu-31	2d	No. Lahontan Basin	Proj. points, waste flakes; 9 entries
28-Hu-32	2d	No. Lahontan Basin	Waste flakes
28-Hu-33	1a, e	No. Lahontan Basin	Misc. stone tools, waste flakes; 15 entries
26-Hu-34	2d	No. Lahontan Basin	Obsidian nodules and waste flakes; no collection
26-Hu-35	2e	No. Lahontan Basin	Misc. stone tools, waste flakes; 22 entries
26-Hu-36	3	No. Lahontan Basin	Proj. point, animal bones; 2 entries

SITE AND FIND LIST (NEVADA) (Continued)

Site No.	Description (Type)	Physiographic Sub-section	Catalogue entries, and Materials Collected
26-Hu-37	2c	No. Lahontan Basin	Proj. points, misc. stone tools, waste flakes; 11 entries
26-Hu-38	3	No. Lahontan Basin	Proj. point, misc. stone tools, waste flakes; 9 entries
26-Hu-39	1e	No. Lahontan Basin	Proj. points, manos, pestle, misc. stone tools; 112 entries
26-Hu-40	3	No. Lahontan Basin	Waste flakes, animal bones; 1 entry
26-Hu-41	2c	No. Lahontan Basin	Proj. point, waste flakes; 3 entries
26-Hu-42	4	No. Lahontan Basin	Misc. stone tools; 4 entries
26-Hu-43	1f, 4	No. Lahontan Basin	Misc. stone tools, waste flakes; 22 entries
26-Hu-44	2f	No. Lahontan Basin	Proj. points, misc. stone tools, waste flakes; 12 entries
26-Hu-45	3	No. Lahontan Basin	Waste flakes, animal bones; no collection
26-Pe-67	1b	Carson-Humboldt Basin	Proj. points, manos, metates, misc. stone tools; 82 entries
26-Pe-68	1b	Carson-Humboldt Basin	Proj. points, manos, grinding stones, misc. stone tools, **Olivella** shell beads; 19 entries
26-Pe-69	2e	Carson-Humboldt Basin	Proj. points, waste flakes; 2 entries
26-Pe-70	2d	Carson-Humboldt Basin	Misc. stone tools; 16 entries
26-Pe-71	2b	Carson-Humboldt Basin	Misc. stone tools; 3 entries
26-Pe-72	2b	Carson-Humboldt Basin	Misc. stone tools; 3 entries
N-2-333		Carson-Humboldt Basin	One obsidian scraper
N-2-389		Carson-Humboldt Basin	One waste flake
26-Pe-73	2a	Carson-Humboldt Basin	Waste flakes
26-Pe-74	2d	Carson-Humboldt Basin	Proj. point, waste flakes; 2 entries
26-Pe-75	2d, g	Carson-Humboldt Basin	Proj. points, waste flakes; 6 entries
26-Pe-76	2a, e	Carson-Humboldt Basin	Waste flakes; 1 entry
26-Pe-77	1g	Carson-Humboldt Basin	Manos, metates, misc. stone tools, waste flakes; 24 entries
26-Pe-78	2d	Carson-Humboldt Basin	Waste flakes; 5 entries
26-Pe-79	1g	Carson-Humboldt Basin	Manos, metates, misc. stone tools, waste flakes; 24 entries
26-Pe-80	1g	Carson-Humboldt Basin	Proj. points, manos, metates, misc. stone tools; 26 entries
26-Pe-81	2g	Carson-Humboldt Basin	Waste flakes
26-Pe-82	3	Carson-Humboldt Basin	Proj. point, animal bones; 4 entries
N-2-5393		Granite Springs Basin	Waste flake
N-2-6739		Truckee Basin	Basalt knife

SITE FEATURES

Several kinds of features were recorded at sites along the pipeline route. Brief mention of petroglyphs has been made, and these and various other site features—semi-circular, circular, and oval rock alignments, talus pits, a circular house (?) depression, rock cairns, bed rock mortars, fire hearths, and miscellaneous features — will be described in the following section.

Petroglyphs

Sites with a Single Pecked Petroglyph. Two sites with a single pecked design present on nearby basalt outcroppings were found. These were Oe-149 and Oe-156, both in Owyhee County, Idaho. The design element recorded at Oe-156 is shown in Plate 21b. The photographs of the petroglyth at Oe-149 did not turn out well, and they are not included in the plates.

The terminology used to describe petroglyph design elements in this report is that of Heizer and Baumhoff (1962: 72-93). The design element present at Oe-149 is apparently that of a "tailed circle". The petroglyph is composed of a circle about five inches in diameter with two long straight lines emanating from its top. Two other lines, one with a right-angle tail, the other broken, partially divide the circle into sectors.

The design element at Oe-156 is easily recognizable. It is composed of a pair of circles connected by a line. The petroglyph is about nine inches long, and the circles are about three inches in diameter. This design is partially covered with lichens and it appears to be much deeper and older than the design at Oe-149.

The tailed circle petroglyph is located on a basalt outcropping which forms a cliff of rim

rock about 12 feet high. The cliff overlooks a small intermittent drainage. The outcropping is broken near the site and surface run-off follows the break in the rim rock. These breaks or gaps in the rim rock are favored browsing spots for both antelope and cattle.

The petroglyph was pecked into a vertical face of a basalt column which forms a ledge over a very small rock shelter. Large talus boulders in front of the shelter conceal the design element. The glyph is located about three feet above the ground surface.

The connected circles at Oe-156 are located on the east wall of an isolated basalt or rhyolite outcropping cut through by a small stream. The petroglyph is approximately ten feet above the stream bed. A flat vertical face of rock was chosen for execution of the design. When the site was recorded in June 1962, three depressions in the stream bed, forming natural water storage tanks, were filled with potable water. Undoubtedly these depressions hold some water even in dry years.

Sites with Several Pecked Petroglyphs. Five sites are included in this grouping, all of them located in Owyhee County, Idaho. These sites all have more than one but fewer than fifteen petroglyphs. The figures occur as single design elements on rock panels or in groups of two or more.

The first petroglyph site encountered near the pipeline right-of-way was Oe-146. The design elements are shown in Plate 19, *a, b, c, d.* They occur on talus boulders and upon smooth vertical faces of a dark brown basalt cliff about 25 feet high. The cliff and the talus slope below rise some 100 feet above a broad valley. The area chosen for execution of the design elements is a u-shaped break in the basalt rim rock about 300 feet wide. The talus slope below the outcropping receives quite a bit of surface run-off from a plateau above the site, and a colorful association of plants, dominated by the bright yellow flowers and dark green leaves of the Mule-ear, *(Wyethia amplexicaulis)* covers the slope.

Nine pecked petroglyphs were recorded at this site. A more exhaustive examination of the area might locate others. The design elements at Oe-146 are all small figures, not one exceeding a foot in its largest dimension. Designs repeated twice include an oval grid, a wavy line, and a headless, square-bodied human figure. Single design elements include a u-shaped design, a bisected oval with a tail, and a group of dots. Only one of these petroglyphs, an oval grid, was executed on a talus boulder. The others were pecked on smooth vertical faces of the basalt cliff.

Site Oe-163 is another pecked petroglyph site on a basalt outcropping. The design elements are shown in Plate 17, *a, b, c, d.* Unlike the petroglyphs at Oe-146, half of the designs at Oe-163 occur on a horizontal face or panel of a large talus boulder. The basalt outcropping itself is composed of huge broken blocks ten to twelve feet high and eight to ten feet wide. Several of these large blocks have broken away from the cliff and toppled on their sides creating sheltered areas, with a thick vegetative cover, mostly bunch grass. These areas serve as animal burrows.

Twelve pecked petroglyphs were recorded at Oe-163. Those on vertical faces of the outcropping appear shallower than those on the talus boulder. Lichens cover some of the deep designs on the boulder. Elements repeated twice at the site include a snake, a short diagonal line, and a bisected oval design. The snake elements were pecked into the boulder, while the other repeated designs were placed on vertical faces of the rock outcropping. Other designs are difficult to identify, but discernable are a tailed oval figure, a tailed circle, a y-shaped curvilinear meander, a lizard, a star or asterisk, and a bird track. The petroglyph panel on the talus boulder was damaged by vandals. About one fourth of the design area was removed. Superimposition of elements is apparent on the boulder where a lightly pecked tailed-circle design element is superimposed over a deeply pecked snake design. The largest petroglyph at the site is the tailed-oval figure which is about two feet long.

A third petroglyph site at which fewer than fifteen designs were recorded is Oe-168. The petroglyph group at this site occurs on the same basalt outcropping as Oe-146, but Oe-168 is some two miles northwest of Oe-146 and the two are considered separate sites. Twelve pecked petroglyphs were recorded at Oe-168. Several are shown in Plate 20, *a, b, c, d,* and Plate 21, *d.* Four of the designs were executed on horizontal or

nearly horizontal surfaces of talus boulders and the remainder on vertical faces of the basalt outcropping.

Repeated designs are a circle, which appears three times, a rake, a snake, and a cross, each of which appears twice. Other design elements are dots, short diagonal lines, an oval grid, a figure-eight with an extra loop, and an incompletely closed figure-eight. The largest and deepest petroglyph is that of a snake on a talus boulder. It is approximately 15 inches in length. Other petroglyphs may be present near the ones just described. The entire length of the cliff face was not thoroughly examined.

The fourth petroglyph site is Oe-170. Unlike the previously described sites, all of the petroglyphs at Oe-170 occur on a single vertical or nearly vertical face of a talus boulder standing in an upright position. The boulder is located about 20 feet below basalt rim rock overlooking Battle Creek. The petroglyphs are pecked into the southwest face of the boulder. In the opposite direction, a magnificent view of the valley may be obtained. The flat surface chosen for execution of the designs encompasses an area of some 30 square feet. The design elements do not completely cover the rock surface, but they are spaced in such a manner that an overall balance is achieved. (Pl. 18, *a, b).*

Two designs dominate the panel. One is composed of three rakes. The topmost rake follows the natural contour of the rock. While most of the short vertical lines forming the "teeth" of this rake end at the horizontal cross bar, about one-third of the teeth extend below the bar. A shorter rake, about one foot long, is attached to the upper rake by means of two such extended lines. A third rake is set in a vertical position with the teeth extending to the right of the cross bar. The second prominent design is composed of three bisected ovals, one on top of the other. One hemisphere of the topmost oval contains three dots. To the right of the ovals, a vertical line arcs slightly toward six dots also set in a vertical position. Three other groups of dots, two curvilinear meanders, a bird track, and a foot or paw complete the list of elements.

One other pipeline site in Idaho contained petroglyphs. This site, Oe-169, is a butte-top site with many rock structures or rock alignments dominating the site area. These structures will be described later. The petroglyphs at Oe-169 are located at the base of the butte. They were pecked on small, smooth vertical faces of the basalt blocks comprising the base of the butte (Pl. 18, *c, d).* Two design elements were noted. One is made up of five dots. The second petroglyph is composed of two feet or paws, each with five circular toes.

Sites with Extensive Petroglyph Panels. Two sites fall into this category, Hu-42 and Hu-43, both located in Humboldt County northwest of the community of Paradise Valley, Nevada. These newly recorded sites double the number of known petroglyph sites in Humboldt County (Heizer and Baumhoff 1962: 37-37). Because several residents of Paradise Valley took such a keen interest in the survey and showed us the rock outcroppings bearing the petroglyphs, the two sites are named in their honor.

The Chabot-Short-McAuliffe Petroglyph Site (Hu-42) is located on a low basalt hill flanking the eastern margin of the Santa Rosa Range below Paradise Peak. The hill is about 300 feet high, and forms a dark, rounded and rocky outcropping dwarfed by the lofty peaks which rise above it. The petroglyphs are located on the eastern slope of the hill about 150 feet above the valley floor, and roughly one-third of the way up the slope of the hill. The petroglyphs are confined to a u-shaped break in the basalt outcropping, appearing on flat faced boulders, three or four feet high and equally as wide, which extend for a distance of 60 feet along the hillside. Some designs are also found on horizontal faces of talus boulders. Although there is some superimposition of design elements, pecking was the only process used to make the petroglyphs.

Design elements at the site are shown in Plates 14, 15 and 16. Circular designs, hands and sun discs seem to be the most prominent figures, the former varying in size from well over two feet in diameter to less than four inches in diameter. The petroglyphs at Hu-42 may be reduced to the following 24 design elements: circle, concentric circles, bisected circle, sectioned circle, spoked circle, tailed circle, circle cluster, bisected circle with a spear, sun disc, curvilinear meander, dumbbell, dots, wavy lines, oval grid, oval, cross, parallel straight

lines, zigzag lines, rake, plant form, many-legged insect, large insect, hand, and human stick figure. Three of these elements are not included in Heizer and Baumhoff's (1962) typology of design elements. The bisected circle with a spear may actually represent an atlatl (Pl. 15, *a*), although the figure differs from the atlatl petroglyphs described by Heizer and Baumhoff (1962: 108, Fig. 45a; 118, Fig. 55a). The oval design is merely an unmodified oval-shaped figure. The "large insect" is represented by three examples all of which have either antennae, ovipositors, segmented bodies, or some other insect-like features. A further study of this petroglyph locality may reveal other design elements which were overlooked.

Designs appearing fresher than others were a rake, a small oval, the innermost circle of three concentric circles, dumbbells, and a hand. Two hand designs are superimposed upon circular designs, as is a dumbbell upon a tailed circle.

Following Heizer and Baumhoff's method for defining styles (1962: 202), which in part states that a style is represented if "(a) more than 11 diagnostic elements of that style are present or (b) more than 20 per cent of all diagnostic elements are of that style", it would appear that petroglyphs at Hu-42 were executed in the Great Basin Curvilinear Abstract Style.

The Hamlin-Pasquale Petroglyph Site (Hu-43) is located near Santa Rosa Peak high above Paradise Valley on the Dry Fork of Mullinax Creek, at an elevation of about 7500 feet. The mountain top rises some 500 feet above the site, and in winter the entire area is snow-covered. The view southeast from the schist outcropping overlooks deep v-shaped canyons which lead down to the Paradise Valley Basin. *Wyethia* or Mule ear plants dominate the vegetation. An outcropping of micaceous schist at one edge of a narrow plateau was chosen for execution of the petroglyphs (Pl. 9, *a*). The outcropping is cut through by a spring-fed intermittent drainage, a tributary of Mullinax Creek. This micaceous schist outcropping is not a solid mass of rock like that formed by a basalt flow, but a series of smaller broken outcroppings, extending for a distance of 100 yards along a canyon rim. The smooth rock surfaces on which the petroglyphs appear generally face southeast. These surfaces usually occur at a 90 degree angle to cleavage planes of the schist, and attempts by collectors to remove a petroglyph or two has resulted in partial destruction of the glyphs.

Design elements at Hu-43 are shown in Plates 9, 10, 11, 12, 13 and 21, *c*. Unlike all other petroglyph sites described in this report, a second technique for making designs was utilized. This technique has been described elsewhere as "scratching". I would prefer to call the technique "incising", because several of the glyphs are deeply incised and not merely scratched into the rock surface. While design elements made by scratching or incising are not numerous, they nevertheless occur in sufficient numbers to be representative of a second style of petrography. The scratched or incised petroglyphs appear to be much more recent than the pecked petroglyphs, and in some instances, they are superimposed upon pecked design elements.

Again following Heizer and Baumhoff (1962: 73), most of the pecked petroglyphs at this site may be reduced to the following 28 design elements: circle, concentric circles, bisected circle, tailed circle, circle and dot, circle cluster, connected circles, chain of cirles, sun disc, curvilinear meander, connected dots, dumbbell, dots, wavy lines, oval grid, rectangular grid, cross, bird tracks, parallel straight lines, zigzag lines, star or asterisk, ladder with two poles, rake, rectilinear meander, cross hatching, plant form, sheep horns (?), and many-legged insect. In addition to these, five other designs not established in Heizer and Baumhoff's typology were noted. These are small horseshoe shaped figures in groups, parallel wavy lines very much like contours on a contour map, connected ovals with legs, a box or platform in a pine tree, and a continuous figure eight or a figure eight with more than two loops.

The scratched or incised petroglyphs, as previously stated, are few in number. Design elements include a pair of chevrons connected by short straight lines, chevrons, zigzag lines, straight parallel lines, cross hatching, and a headless human stick figure. These are shown in Plates 11, *c* and 12, *c*.

In summary, it appears that three styles of petrography are represented at Hu-43. Design

elements diagnostic of the Great Basin Curvilinear Abstract Style, Great Basin Rectilinear Abstract Style, and Great Basin Scratched Style, as defined by Heizer and Baumhoff (1962: Chapter IV, 197-209) are represented at the site. The presence of scratched or incised petroglyphs at Hu-43 extends the known range of the Great Basin Scratched Style of petrography northward into Humboldt County.

Surface Structures and Other Features

Semicircular, Circular, and Oval Rock Alignments. Clusters of semicircular, circular, and oval rock walls were found at two sites, Oe-169 and Oe-171, located about three miles apart in Owyhee County, Idaho. Both sites exhibiting these features are located on top of basalt buttes or small mesas separated from other basalt outcroppings by a saddle.

Site Oe-169 was discovered when we climbed to the top of a butte to examine a pile of boulders about six feet high, apparently a land survey marker. The low stone walls scattered over the butte top were noticed immediately. The structures range in size from circular shaped rock enclosures about five feet in diameter to open rock arcs measuring some 16 feet across a chord on the arc. The dry laid basalt rock walls vary in height from a single course of rocks about eight inches to a foot high to a pile of basalt boulders two and one half to three feet high.

These low stone walls were first thought to be defensive works of U. S. Troops trapped on the butte by hostile Indians, but when the site was mapped, much doubt was cast upon this interpretation. A plan view of Oe-169 is shown in Figure 1. The 33 stone walls do not appear to be aligned with a view to defense of the butte top (See also, Pl. 5, *a, b, c, d).* A sweeping view of the terrain in three directions is commanded from the site, however, and it is possible that the structures represent military artifacts. Some evidence supporting this interpretation was provided by a local rancher, who said that formerly many .44 rifle cartridges had been recovered from the mesa top.

The second butte top site exhibiting such low stone structures was found by examining the surrounding countryside through binoculars from Oe-169. This second site, Oe-171, is similar to Oe-169, except that instead of overlooking a broad flat valley, the butte overlooks the deeply incised canyon of Battle Creek. Furthermore, while only 11 stone circles, arcs, or ovals were recorded at the latter site, nine low stone walls ranging up to 40 feet in length were also recorded. The plan view of these structures is shown in Figure 2. The basalt boulders comprising the walls were dry laid and apparently had not been moved or disturbed in recent times. Lichen patterns and weathered upper surfaces on the boulders attested to the antiquity of the structures.

Since site Oe-171 is actually located on a creek bearing the name "Battle Creek", further inquiry into the supposed military use of the structures was made. In reply to a letter of inquiry Dr. Merle Wells, Historian and Archivist at the Idaho State Historical Museum in Boise, wrote (personal communication): "The name Battle Creek was in use before the Bannock War; and although for a time some people thought the Battle of South Mountain took place on Battle Creek, that impression turned out to be an error. There seems to be a battle site there though; and whatever the battle there was, it ought to have occurred before 1870. It may be that when we check through the 200 battles or so of the Snake War that we will find one of them listed for Battle Creek."

However, unless further research indicates more clearly a historic origin for these stone structures, there are several reasons for considering them more probably the work of aboriginal peoples who inhabited the region. A few small projectile points and many waste flakes from stone chipping were found on top of the butte at Oe-169. Petroglyphs were found along the base of this same butte. A saddle connecting site Oe-171 to basalt rim rock was littered with knives, projectile points, and other tools. Numerous waste flakes from stone chipping were recovered from the structures on top of the buttes. Moreover, many similar structures have been found elsewhere in Idaho and in the Great Basin. The structures at both sites would appear to provide effective cover and concealment for hunters waiting to ambush game, and similar structures in some instances have in fact been identified as "hunting blinds". Therefore this interpretation of the rock structures at Oe-169 and Oe-171 seems most credible at present.

Talus Pits. Talus pits differ from rock structures just described in several ways. In Idaho, they commonly are found on talus slopes below basalt outcroppings. In making such a pit, rocks are thrown out of an area or piled around the edge of a depression in talus debris. These structures have been found elsewhere in the Columbia Plateau, and may have socio-ceremonial significance. It is believed that some of the pits were utilized during vision quests (Caldwell and Carlson 1954: 441-2).

Two sites having what appeared to be man-made pits in talus slopes were recorded. One such pit was recorded at El-53, Elmore County, Idaho (Pl. 7, *d).* This pit was approximately four feet in diameter and some three feet deep. Other pits were noted at Oe-170 in Owyhee County, Idaho, but no measurements were taken.

Rock Cairns. Only two rock cairns were located during the survey. Both were on a basalt ledge adjacent to site Oe-145, Owyhee County, Idaho (Pl. 7, *a).* The cairns were simply piles of basalt boulders in natural depressions. The piles were both about one foot high and two or three feet in diameter. One of these cairns was dismantled, but nothing was found beneath the rocks.

Circular House Pit. One circular depression resembling a "Plateau" house pit was located by the survey. This depression, possibly a wickiup floor, was found at Hu-21 in northern Humboldt County, Nevada. The depression is about twelve feet in diameter and two and one half feet deep. Projectile points, waste flakes, and scrapers were recovered from the rim of the depression. This feature is located about 50 yards northwest of the pipeline right-of-way (Pl. 7, *c).*

Bedrock Mortars. Bedrock mortars were recorded at two sites in Owyhee County, Idaho. The mortars at Oe-145 are located on a basalt ledge near the previously described rock cairns. The bowl-shaped depressions are about ten cm. in diameter and some five cm. deep. Mortars in bedrock adjacent to a small spring were recorded at Oe-167. These pits range in diameter from 6.5 to 8.5 cm. and in depth from 5.0 to 15.0 cm. Three of these mortars are shown in Plate 8, *a, b.*

Fire Hearths. In addition to the fire hearth at El-56 (Elmore County, Idaho; see Test Excavations, Appendix C, p. 84, and Pl. 7, *b),* several others were noted at one site in Pershing County, Nevada, Pe-67. This site is an extensive camp in sand dunes adjacent to the Humboldt River. The fire hearths, areas of white ash and charcoal, were found on the upwind side of the dunes or in bowl-like depressions between dunes.

Miscellaneous. One site on the North Fork of the Little Humboldt River, Hu-20, in Humboldt County, Nevada, has what appeared to be a collapsed structure made of driftwood poles. The poles are some six to eight feet long and two to three inches in diameter. They radiate out from a central hub area, much like the spokes of a wheel. While the arrangement of poles may be an accident of nature, it seems more than likely that humans, possibly modern stockmen, were the agents responsible for the arrangement.

PART V

ARTIFACTS

CHIPPED STONE ARTIFACTS

While the survey was in progress it was apparent that chipped stone artifacts would comprise a major portion of the artifact collection and that such stone tools would yield the bulk of the survey data. Two classes of artifacts in particular were recovered in quantity. These were projectile points and scrapers of all types. A total of 326 typable projectile points were collected. For descriptive purposes, these were split into 35 groups. Other chipped stone tools recovered and classified were flake points, knives, choppers, drills, gravers, scrapers and waste flakes.

Materials

Waste flakes from stone chipping were recovered from the surface of all but a few sites. The collection of more than 7500 waste flakes was analyzed and seven classes of rocks and minerals were identified. These were ignimbrite, obsidian, chalcedony, chert, opal, basalt and "others". The latter category is a catch-all for siltstone, mudstone, limestone, quartzite, and other materials neither identified with certainty nor found in quantity at any one site. In sorting the waste flakes so as to identify the raw materials used, ignimbrite and obsidian flakes were separated first from the other materials. The ignimbrite was then separated from obsidian by using a bright light to test the flakes for translucent or transparent edges. If such a property were present, the flake was considered obsidian, for ignimbrite flakes, as a rule, lack this property. No attempt was made to identify jasper, agate, quartz, or other similiar materials. These materials all were considered chalcedony. Chert, opal, and basalt flakes were identified by gross examination of their properties—color, luster, and so on.

The distribution of raw materials, worked out from an examination and identification of the waste flakes, is very interesting. A tabulation follows of the percentage of each material present at seventeen sites at which more than 100 waste flakes were recovered.

The table below shows quite clearly that the sample of waste flakes collected along the right-of-way either reflects cultural preferences for certain raw materials, or local or regional availability of certain materials. While the distribution could be attributed to the preferences of the collectors, this possibility can be discounted, as no conscious or arbitrary controls were imposed by the collectors in the process of recovering the flakes from the surface of the sites. There are three sets of figures which stand out in the above table. One is the rather heavy utilization of chalcedony and similar materials in southwestern Idaho. Waste flakes of this material comprise from 20% to 80% of the collections from that area. The second is the relatively high percentages of basalt waste flakes recovered from three sites in Elko County, Nevada. There, basalt flakes occur in greater proportions, ranging from 13% to 63%,

Site No.	Ignimbrite	Obsidian	Chalcedony	Chert	Opal	Basalt	Other	Total
10-El-56	21%	35%	20%	15%	2%	3%	4%	207
10-Oe-145	13%	24%	51%	4%	1%	3%	4%	522
10-Oe-151	10%	27%	55%	1%	3%	3%	4%	137
10-Oe-156	7%	19%	64%	2%	8%	—	—	124
10-Oe-169	32%	15%	31%	14%	2%	4%	2%	403
10-Oe-171	9%	3%	80%	3%	5%	—	—	259
26-Elk-26	1%	10%	25%	1%	—	63%	—	137
26-Elk-27	7%	28%	25%	2%	—	38%	—	168
26-Elk-29	5%	23%	53%	5%	—	13%	1%	191
26-Hu-21	—	70%	25%	2%	1%	2%	—	126
26-Hu-30	—	98%	1%	1%	—	—	—	377
26-Hu-39	1%	63%	8%	8%	13%	7%	—	235
26-Pe-67	—	70%	18%	6%	1%	2%	3%	697
26-Pe-70	—	97%	—	—	2%	—	1%	178
26-Pe-72	—	75%	9%	2%	—	13%	1%	161
26-Pe-79	—	97%	1%	1%	1%	—	—	336
26-Pe-80	—	92%	1%	1%	2%	4%	—	199

than elsewhere along the pipeline route. The third set of figures which appear to have some meaning is the high proportion of obsidian waste flakes recovered from sites in Humboldt County and Pershing County, Nevada. The proportions there range from 63% to a very high 98%. Ignimbrite is virtually absent in the northern Lahontan Basin, and red and black banded obsidian from Oregon, not found at pipeline sites in Idaho, comprises a small fraction of the obsidian waste flakes from Nevada.

It appears that the local or regional availability of rock and minerals suitable for the manufacture of chipped stone tools largely determined the material utilized, but undoubtedly cultural preferences were exercised in the selection of such materials. The Payette physiographic sub-provinces contain many sedimentary beds and alluvial deposits in which nodules of chalcedony, chert, and obsidian commonly occur. In Elmore County, Idaho, ignimbrite nodules were collected along the flanks of northern tributaries to the Snake River. Fine-grained basalt outcroppings were noted in northern Elko County, Nevada, and obsidian nodules, exposed by sheet erosion, were observed in Humboldt County, Nevada (Pl. 8,*d*).

Projectile Points

As mentioned previously, 326 typable projectile points were collected. An additional 195 projectile point parts also were collected, but these were too fragmentary for analysis and classification. The typable points were sorted into 35 descriptive groupings, which were further divided into numerous subcategories. Gross morphologieal features determined the groupings, and as Gruhn (1961a: 52) put it, a *type* is presented here merely as a descriptive grouping—"a system extracted from the assemblage by the classifier on the basis of the definite criteria of form". Existing point classificatory systems were not ignored, nor should the number and letter "type" designations assigned to the several point groups be eonsidered a new system.

The descriptive format used to describe the points also follows that used by other archaeologists. This format, or slightly different versions of it, have been used by Jennings (1957), Swanson, Tuohy, and Bryan (1959), Bryan and Tuohy (1960), and Gruhn (1961a), as well as by others. In my opinion, the format is both convenient and adequate for the description of projectile points and their morphological variation. It usually contains nine entries, most of which are self-explanatory, but a word might be said about a few of them. Under the heading of "form", the gross morphological features of each point group are described. A basic division is made between stemmed and unstemmed point forms, although even this distinction is not always clear cut. There are some point forms more or less transitional in outline. Other deseriptive features of the several point types are standard features of projectile point analysis, such as basic shape, blade edge, cross-section, flaking, serration, shoulder shape, stem shape, notches, barbs, basal thinning, and so on. The entry entitled "distribution" contains a listing of the sites along the pipeline at which the type of point in question was found. If more than one point of a single type was recovered from a single site, the number of specimens is indicated in parentheses following the site symbol. The section dealing with eomparable types is not intended to be an exhaustive comparison of projectile point forms in the Great Basin, but merely a suggestion of localities where identical or similar point types have been recovered. Many of the distributions had been worked out by Gruhn (1961a), Hunt (1960), Jennings (1957) and others, and these were checked against the pipeline points whenever the illustrations permitted such a check.

Type: 1, (Pl. 22, *a)* **No. of Specimens**: 2

Form: Unstemmed form; small, triangular outline; blade edges — slightly convex; cross section—plano-convex and lenticular; flaking —regular; base—straight.

Technique: Specimens are made from flakes; moderately well controlled pressure flaking. Thinning flakes removed from base.

Size Range: 1.8-1.9 x 0.9-1.0 x 0.2-0.3 cm.

Material: Obsidian

Distribution: Oe-145 (2)

Comparable Types: Idaho point Type 1: Swanson, Tuohy, and Bryan 1959: 6 Wilson Butte, Idaho, Type 6a: Assemblage VI, Dietrich Phase: Gruhn 1961a: 58

Pictograph Cave, blade Type 2: Mulloy 1958, Fig. 11, Nos. 11, 12

Wagon Jack Shelter, Nevada, Cottonwood triangular: Heizer and Baumhoff 1961: 127, Fig. 5g

Stuart Rockshelter, Nevada, Paiute-Pueblo level: Shutler 1960: 33, Plate 7e

Pence-Duerig Cave, Idaho, Type 4: Gruhn 1961b, Fig. 2E

Garrison site Type 3: Taylor 1953: 45

Danger Cave Type W-40: Jennings 1957: 130

Western Utah Type II B1: Rudy 1953, Fig. 37f

Turner-Look site, Fremont Type A: Wormington 1955, Fig. 31

Death Valley IV: Hunt 1960, Fig. 61, r-a

4 Iny 2, Owens Valley, California, Type 5: Riddell 1951, Fig. 1-5

Type 1, Mono County, California: Meighan 1955, Plate 3, No. 2

Stahl site, Little Lake, California: Harrington 1957, Fig. 41, last in bottom row.

26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4, d

Huntington Lake Region, California: Hindes 1962, Plate 1, A, a, b, c

Deer Creek Cave, Nevada, Type 11a: Shutler and Shutler, n.d.

Comment: A widely distributed point type generally occurring in late contexts.

Type: 1a, (Pl. 22, *b)* **No. of Specimens**: 1

Form: Unstemmed form; small, triangular outline; blade edges — convex; cross-section — strongly plano-convex; flaking—regular; base —slightly excurvate.

Technique: Bifacially flaked specimen with no apparent effort expended to reduce the thickness. Made on a flake.

Size Range: 2.5 x 1.7 x 0.7 cm.

Material: Ignimbrite

Distribution: Oe-145 (1)

Comparable Types: See distribution of point type 1.

Comment: This represents a variety of point type 1. It has roughly the same outline as type 1 points, but it was made from a very thick plano-convex flake.

Type: 1b, (Pl. 22, *c)* **No. of Specimens**: 1

Form: Small, triangular outline; blade edges straight; cross-section — lenticular; flaking well-controlled——regular; base——excurvate.

Technique: Very well controlled pressure flaking with narrow flaking scars in evidence. Basally thinned.

Size Range: 0.7+ x 1.2 x 0.2 cm.

Material: Obsidian

Distribution: Oe-141

Comparable Types: See distribution of type 1 points.

Comment: This specimen also represents a variety of point type 1; sufficiently distinctive to merit separate description as a variety or sub-type.

Type: 1c, (Pl. 22, *d)* **No. of Specimens**: 1

Form: Unstemmed form; miniature point; very small triangular miniature point with straight base; blade edge—convex, cross-section — plano-convex; flaking — regular, narrow; base—straight.

Technique: This miniature point is made on a flake. The dorsal face exhibits a slight ridge or keel.

Size Range: 1.3 x 0.75 x 0.3 cm.

Material: Obsidian

Distribution: Pe-67

Comparable Types: Possibly a variant of point type 1. Points of this size are often found along the Columbia River and its tributaries. For example, see Cressman 1960: 88-90, Figs. 41a, 41b, 41c, 41d. Also a hafted miniature point was recovered in Tommy Tucker Cave. Fenenga and Riddell 1949: 210, Fig. 56e.

Comment: See also Type 27 and Type 35c for points of comparable size.

Type: 2, (Pl. 22, *e)* **No. of Specimens**: 16

Form: Unstemmed form; small broad triangular outline; blade edges — straight to slightly convex; cross section — plano-convex and lenticular; flaking—regular to broad; base —convex.

Technique: Variable; on plano-convex specimens, pressure retouch on planar face is restricted to edges only; flaking technique moderately well controlled.

Size Range: 1.5-3.6 x 1.2-2.8 x 0.4-0.5 cm.

Material: Obsidian, ignimbrite, opal

Distribution: El-56 (2), Oe-138, Oe-142, Oe-151, Oe-167 (2), Oe-169, Oe-172

Comparable Types: Deer Creek Cave, Nevada, Type II: Shutler and Shutler n.d. El Portal, California: Fitzwater and Van Vlissingen 1960, Plate II, 20

Karlo Site, Type 1a: Riddell 1960, Plate 2, A, 1a

Idaho point type 4: Swanson, Tuohy, and Bryan 1959: 6

Wilson Butte Type 4b, Wilson Butte V Assemblage, Idaho: Gruhn 1961a: 56

Death Valley, California; Death Valley III-IV: Hunt 1960: 237, Fig. 61f

Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 127, Fig. 5n

Danger Cave Type W-44: Jennings 1957: 134 (Danger Cave Type is larger)

Type 2, Mono County, California: Meighan 1955, Plate 3, no. 5

Stahl Site, Little Lake, California: Harrington 1957, Fig. 41, bottom row center ("Flake point")

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58d

Kramer Cave, Nevada: Shutler, Rozaire and Shutler n.d.

Comment: These specimens grade into larger, but thinner specimens which were classified as knives (see Knife Type 2. p. 53).

Type: 2a (Pl. 22, *f)* **No. of Specimens**: 1

Form: Unstemmed form: small, narrow elongated triangular outline; blade edges — straight; cross section—strongly plano-convex or keeled; flaking — regular, narrow; base — convex.

Technique: Planar face lacks over-all pressure flaking; keeled face exhibits regular over-all flaking. The specimen was made from a curving flake.

Size Range: 3.1+ x 1.4 x 0.4 cm.

Material: Obsidian

Distribution: Pe-72

Comparable Types: Wagon Jack Shelter, Nevada: Unnamed type: Heizer and Baumhoff 1961: 127, Fig. 5, k, m, n

Type I Mono County, California: Meighan 1955, Plate 3, no. 3

Comment: The longitudinal, crescentic-shaped cross section of this point separates the specimen from others of the same general form.

Type: 2b (Pl. 22, *g)* **No. of Specimens**: 2

Form: Unstemmed form; small, narrow elongated triangular outline; blade edges—convex; cross-section — biconvex; flaking — regular, broad; base — convex.

Technique: Rather broad flakes removed from both faces. Fine retouch lacking.

Size Range: 3.3-2.4+ x 1.5-1.6 x 0.6-0.7 cm.

Material: Ignimbrite

Distribution: Oe-139, Oe-169

Comparable Types: See sub-type 2

Comment: These specimens have the same outline as the variety 2a point, but they lack the "keel", and the chipping scars are broader and less well-controlled.

Type: 3 (Pl. 22, *h)* **No. of Specimens**: 13

Form: Unstemmed form; small, broad triangular outline; blade edges—straight to convex; cross-section — plano-convex and lenticular; flaking—regular, narrow to medium; base —concave.

Technique: These appear to be made from small flakes. Reduction of bases perhaps gives concave form to basal edge. Planar faces of plano-convex specimens lack over-all retouching.

Size Range: 1.5-2.4+ x 1.2-1.9 x 0.3-0.6 cm.

Material: Ignimbrite and obsidian

Distribution: El-58, Oe-145, Oe-149 (2), Oe-151, Oe-162, Oe-164, Oe-165, Oe-167, Hu-17 (2)

Comparable Types: Idaho point type 3: Swanson, Tuohy, and Bryan 1959: 6

Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 127, Fig. 5h

Death Valley, California, Death Valley IV: Hunt 1960: 237, Fig. 61 i

Pence-Duerig Cave, Idaho, Type 5: Gruhn 1961b: 2, Fig. 2, f

26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4, e

Huntington Lake Region, California: Hindes 1962, Plate 1, A, d

Deer Creek Cave, Nevada, Type 7n: Shutler and Shutler, n.d.

Type: 3a (Pl. 22, *i)* **No. of Specimens**: 4

Form: Unstemmed form; small, leaf-shaped outline; blade edges—convex; cross-section—lenticular; flaking — regular, medium; basal edge—slightly concave.

Technique: The specimens exhibit over-all flaking on both faces. Basal thinning is in evidence, as is removal of retouching flakes diagonally across face of some specimens.

Size Range: 2.3-2.7 x 1.5-1.7 x 0.4-0.5 cm.

Material: Chalcedony, obsidian, ignimbrite

Distribution: El-61, Oe-171, Elk-29, Hu-17

Comparable Types: Idaho point type 1: Swanson, Tuohy, and Bryan 1959: 6

Wilson Butte type 6b, Assemblage V: Gruhn 1961a: 59, Fig. 13, R, S

Pictograph Cave, Blade Type 2: Mulloy 1958, Fig. 11, nos. 11, 12

Type 1, Mono County, California: Meighan 1955, Plate 3, no. 4

Karlo Site, Type 1c: Riddell 1960, Plate 2, A, lc

Deer Creek Cave, Nevada, Type 7i, m: Shutler and Shutler, n.d.

Comment: The relatively narrow base, slight basal concavity, and lenticular cross-section separate these specimens from others having a similar outline.

Type: 3b (Pl. 22, *j)* **No. of Specimens**: 1

Form: Unstemmed form; small asymmetrical triangular outline; blade edges—straight and convex; cross-section — lenticular; flaking — regular, medium; base—slightly concave.

Technique: This specimen was made on a flake. Moderately well controlled pressure flaking. Basal thinning.

Size Range: 3.1 x 1.3 x 0.3 cm.

Material: Obsidian

Distribution: Pe-77

Comparable Types: Wilson Butte Cave, Type 5a, Assemblage V: Gruhn 1961: 56

Deer Creek Cave, Nevada, Type 31: Shutler and Shutler, n.d.

Type: 3c (Pl. 22, *k)* **No. of Specimens**: 1

Form: Unstemmed form; small triangular, asymmetrical outline; blade edges — straight and convex; cross-section—plano-convex; flaking—regular, narrow; base—slightly concave.

Technique: Incompletely reduced flake; well controlled pressure flaking directed from the edges on both faces.

Size Range: 2.2+ x 1.4 x 0.3 cm.

Material: Chalcedony

Distribution: Oe-139

Comparable Types: Idaho point type 6: Swanson, Tuohy, and Bryan 1959:7

Wilson Butte Cave Type 5c, Assemblage V: Gruhn 1961a: 57, Plate 13, M

Danger Cave Type W41: Jennings 1957: 131

Huntington Lake Region, California: Hindes 1962, Plate 1, A, f

Comment: The specimen might have been designed as a small knife.

Type: 4 (Pl. 22, *l)* **No. of Specimens**: 10

Form: Unstemmed form; small to medium lanceolate outline; blade edges—convex; maximum width of blade near the middle (middle 1/3); cross-section — lenticular; flaking — regular, medium to narrow; base — prominently concave.

Technique: All specimens exhibit well controlled bifacial pressure flaking, save for 3 basal fragments from Oe-156, Oe-171, and Hu-17. These specimens also exhibit oblique flaking obscured on specimens with serrated edges by the subsequent removal of horizontal parallel flakes.

Size Range: Tips of all specimens are missing. Nearly complete specimen measures 3.7+ x 2.0 x 0.6 cm.

Material: Obsidian

Distribution: Oe-156, Oe-171, Elk-39, Hu-16, Hu-17, Hu-21 (2), Hu-26, Pe-67, Pe-69.

Comparable Types: Site F, Falcon Hill, Nevada: Shutler, Rozaire and Shutler, n.d.

Idaho point type 17: Swanson, Tuohy, and Bryan 1959: 10 (similar)

Danger Cave W-8: Jennings 1957: 108

Karlo Site, Sub-type 9d: Riddell 1960, Plate 2, B, d, middle and right

Huntington Lake Region, California: Hindes 1962, Plate 1, e, o

El Portal, California: Fitzwater and Van Vlissingen 1960, Plate II, 10, 11

Deer Creek Cave, Nevada, Types 7i, 7q; Shutler and Shutler, n.d.

Comment: This group is distinguished as a variety of type 4 point largely on the basis of blade outline which is lanceolate with maximum width near the middle 1/3 of blade.

Type: 4a, (Pl. 22, *m)* **No. of Specimens**: 4

Form: Unstemmed form; small lanceolate outline; blade edges—convex; maximum width of blade near the base (lower 1/3); cross-section—lenticular; flaking—regular, medium to narrow; base—prominently concave.

Technique: All exhibit well controlled bifacial pressure flaking. A characteristic of these specimens is oblique parallel flaking sometimes obscurred by the removal of smaller horizontal parallel flakes from the edges for serrations. Basal thinning also evident.

Size Range: 3.4+-3.5+ x 1.5 x 0.4-0.6 cm.

Material: Obsidian

Distribution: El-56, Hu-16, Hu-19, Hu-21

Comparable Types: Sites A, D, Falcon Hill, Nevada: Shutler, Rozaire and Shutler, n.d.

Wilson Butte, Type 3, Assemblage V: Gruhn 1961a: 55, Plate 36, A

McKean points: Mulloy 1954, Fig. 4, Lower Level, 1-14

McKean points: Wheeler 1952, Plate 10

Southwestern Idaho: Kehoe 1955: 18, Fig. 4, E

Danger Cave Type W6: Jennings 1957: 106

Deadman Cave Type IV: Smith 1952, Fig. 5

Western Utah Type II A 3: Rudy 1953, Fig. 36g

Karlo Type 9c: Riddell 1960, Fig. 7, Plate 2, B, c, middle

Lovelock Cave Type V: Grosscup 1960, Fig. 5, V, Fig. 6, V

Deer Creek Cave, Nevada, Type 7b: Shutler and Shutler, n.d.

Hidden Cave, Nevada: Grosscup 1956: 58

Type: 4b (Pl. 22, *n)* **No. of Specimens**: 1

Form: Unstemmed form; small lanceolate outline; blade edges—convex; maximum width of blade near middle 1/3 of blade; cross-section —both faces are planar surfaces; flaking—regular, narrow; base—concave.

Technique: This point is made on a flake. Fine pressure retouch is limited to edges of both faces.

Size Range: A basal fragment—1.2+ x 1.6 x 0.3 cm.

Material: Obsidian

Distribution: El-56

Comparable Types: No comparable types noted.

Comment: Sufficiently distinctive to be separated from other type 4 points.

Type: 4c (Pl. 22, *o)* **No. of Specimens**: 4

Form: Unstemmed form; small triangular outline; blade edges—convex; maximum width of blade at lower 1/3 of blade or at base; cross-section—lenticular; flaking—variable, regular to broad; base—strongly concave.

Technique: These were made by well controlled pressure flaking. Two specimens are less well made.

Size Range: 1.5-2.0 x 1.2-1.6 x 0.3-0.6 cm.

Material: Obsidian, chalcedony, ignimbrite

Distribution: Elk-27, Oe-171, Hu-21, Hu-39

Comparable Types: See Type 4, of which 4c is a variant.

Lovelock Cave, Nevada, Specimen 1-19201: Loud and Harrington 1929, Plate 56e

Stahl Site (Pinto) "Shoulderless" sub-type: Harrington 1957, top row, fourth from left.

Stuart Rockshelter "Shoulderless Pinto": Shutler, Shutler and Griffith 1960: 33, Plate 7, h

26-Pe-5, Pershing County, Nevada: Elsasser 1958: 27, Fig. 4c

Deer Creek Cave, Nevada, Type 7a: Shutler and Shutler, n.d.

Hidden Cave, Nevada: Grosscup 1956: 58

Comment: These points are separated from others having the same general outline because of their smaller size.

Type: 4d (Pl. 22, *p)* **No. of Specimens**: 3

Form: Unstemmed form; small, broad, concave base point; blade edges—convex; hint of a stem near maximum width of blade; cross-section—lenticular; flaking—regular, medium, diagonally directed; base — prominently concave.

Technique: These are similar to other type 4 points, except that in outline they possess a hint of a shoulder, and the flaking is generally broader. Flaking is moderately well controlled. Some flakes are removed in an oblique parallel fashion.

Size Range: One complete specimen—3.3 x 1.8 x 0.3 cm.

Material: Obsidian, chalcedony

Distribution: Oe-170, Hu-17, Hu-39

Comparable Types: Lovelock Cave, Nevada: Loud and Harrington 1929, Plate 56 b

Type: 4e (Pl. 22, *q)* **No. of Specimens**: 4

Form: Unstemmed form; all specimens are bases, indented base points; blade edges — straight; cross-section — lenticular, plano-convex, and biconvex; flaking varies, regular, fine to coarse; base—prominently concave.

Technique: This is a catch-all grouping for basal fragments with more or less straight blade edges and deeply convex bases. Chipping varies, but technique generally well controlled.

Size Range: 1.9+ - 2.6+ x 1.3-1.6 x 0.4-0.6 cm.

Material: Obsidian, chalcedony, opal

Distribution: Oe-141, Oe-143, Hu-17 (2)

Comparable Types: See type 4.

Lovelock Cave, Nevada, Specimen 1-19209: Loud and Harrington 1929, Plate 56, o

Wagon Jack Shelter, Nevada, Humboldt Con-

cave — Base A Type: Heizer and Baumhoff 1961: 127, Fig. 5a

Type 3, Mono County, California: Meighan 1955, Plate 3. no. 12

Deer Creek Cave, Nevada, Type 7e: Shutler and Shutler, n.d.

Hidden Cave, Nevada: Grosscup 1956: 58

Comment: As mentioned above, these specimens represent a variety of type 4 point.

Type: 4f (Pl. 22, *r)* **No. of Specimens**: 3

Form: Unstemmed form; small to medium isosceles triangular shaped points; blade edges — straight to convex; cross-section — strongly plano-convex or keeled; flaking—oblique parallel on convex face, parallel horizontal on planar face, regular, narrow to medium; base—concave.

Technique: A keeled flake was chosen for this point type. The upper face was reduced by narrow, oblique parallel flaking. Planar faces were only slightly modified by pressure flaking around edges.

Size Range: 3.6-4 x 1.1-1.6 x 0.4-0.6 cm.

Material: Obsidian, chalcedony

Distribution: El-56, Oe-151, Pe-75

Comparable Types: Wilson Butte Cave, Idaho, unplaced: Gruhn 1961a: 57, Plate 13, N

Comment: Seems to be a rather distinctive sub-group.

Type: 4g (Pl. 22, *s)* **No. of Specimens**: 1

Form: Unstemmed form; medium sized, pentagonal point or knife with convex blade edges, tapering to concave base; blade edges—convex; cross-section — lenticular; flaking — regular, medium; base—concave.

Technique: This specimen exhibits moderately well controlled pressure or indirect percussion flaking scars.

Size Range: 2.96+ x 3.0 x 1.25 cm.

Material: Chalcedony

Comparable Types: None

Comment: These may be considered knives, rather than projectile points.

Type: 4h (Pl. 22, *t)* **No. of Specimens**: 2

Form: Unstemmed form; broad blade, rounded shoulders; blade tapers to straight base; pentagonal form; blade edge—convex; cross-section — lenticular; flaking — regular, medium; base—straight.

Technique: Well controlled flaking technique. Basal thinning is evident.

Size Range: 3.2+ x 2.8 x 0.65 cm.

Material: Obsidian, chalcedony

Distribution: Hu-21, Hu-37

Comparable Types: None

Comment: Similar in outline to sub-type 4g, but lacks the concave base of that sub-type.

Type: 5 (Pl. 22, *u)* **No. of Specimens**: 1

Form: Unstemmed form; small leaf-shaped outline with small downward projecting barbs; blade edges — convex; cross-section — plano-convex; flaking—regular, narrow, planar face flaked around edges; base—concave with small projecting barbs.

Technique: Made on a flake, very carefully controlled flaking. Over-all flaking on convex face only.

Size Range: 2.3 x 1.2 x 0.3 cm.

Material: Chalcedony

Distribution: Oe-145

Comparable Types: Karlo Site, Sub-type 9c: Riddell 1960, Plate 2, B, 9c, left

Comment: This point might have been placed in the 3a grouping except that it exhibits small barbs on base.

Type: 6 (Pl. 22, *v)* **No. of Specimens**: 1

Form: Unstemmed form; small broad leaf-shaped, with projecting rounded base; blade edges — convex; cross-section — plano-convex; flaking—regular, medium; base—concave with recurve in central area; rounded barbs.

Technique: Made on a flake by moderately well controlled pressure flaking. Material appears difficult to work. Step-flaking in evidence on planar face.

Size Range: 2.9 x 2.2 x 0.6 cm.

Material: Basalt

Distribution: Oe-140

Comparable Types: No comparable types.

Comment: Similar in some respects to type 5 in this report.

Type: 7 (Pl. 22, *w)* **No. of Specimens**: 1

Form: Unstemmed form; large, broad, leaf-shaped point or knife with concave base; blade edge — convex; cross-section — plano-convex; flaking—irregular, large, incompletely reduced convex face with step flaking; base—symmetrically concave.

Technique: Planar face exhibits a large flak-

ing scar resembling a "flute"; retouching applied after "fluting" scar was made. Convex face exhibits large, irregular, imperfectly reduced surfaces.

Size Range: 3.1+ x 3.0 x 1.1 cm.

Material: Obsidian

Distribution: Pe-82

Comparable Types: This point is identical with Harrington's (1948: 60-71) "crude Folsoms", later identified by Meighan (1955) as Borax Lake Fluted points (Wormington 1957: 63).

Type: 8 (Pl. 22, *x)* **No. of Specimens**: 4

Form: Unstemmed form; small leaf-shaped outline; blade edge — convex; cross-section — lenticular; flaking — regular, narrow; base — straight to slightly concave. Maximum width of point at middle 1/3 of blade.

Technique: Very well controlled oblique diagonal flaking exhibited on all specimens. One of these has serrated edges. The others have slight serrations.

Size Range: 2.2-2.0 x 1.2-1.5 x 0.3-0.5 cm.

Material: Obsidian, chert

Distribution: El-58, Oe-145, Oe-167, Pe-67

Comparable Types: Idaho point type 2: Swanson, Tuohy and Bryan 1959: 6

Wilson Butte Cave, Idaho, Type 5b, Assemblage V: Gruhn 1961a: 56-57, Plate 14, L

Pence-Duerig Cave, Idaho: Gruhn 1961b: 2, Fig. 2, D

Comment: These are very well made points.

Type: 9 (Pl. 22, *y)* **No. of Specimens**: 2

Form: Stemmed form; leaf-shaped blade, expanding straight based stem; blade edge—convex; cross-section — lenticular; flaking — regular, broad; stem—expanding; base—straight.

Technique: Rather broad shallow flakes were removed from both faces, yet the chipping technique appears to have been well controlled.

Size Range: 4.1-3.0+ x 1.9 - 2.2 x 0.6-0.7 cm.

Material: Obsidian

Distribution: Elk-28, Hu-17

Comparable Types: Karlo Site, Sub-type 9i: Riddell 1960, Plate 2, B, 9, i

Deer Creek Cave, Nevada, Type 28: Shutler and Shutler, n.d.

Type 9a (Pl. 22, *z)* **No. of Specimens**: 1

Form: Stemmed form; medium lanceolate outline; blade edge — convex; cross-section — lenticular; flaking — regular, broad; base — slightly concave. Maximum width of blade at middle 1/3 of blade. Suggestion of a tapering stem and slight serrations.

Technique: Rather large flakes were removed from both faces. The retouching covers both faces of the point.

Size Range: 4.5 x 1.6 x 0.6 cm.

Material: Obsidian

Distribution: Hu-39

Comparable Types: Pence-Duerig Cave, Idaho, Type 7: Gruhn 1961b: 2-3, Fig. 2, H

Wilson Butte Cave, point type 3, Assemblage V: Gruhn 1961a, Plate 13, H

Karlo Site, Sub-type 9b: Riddell 1960, Plate 2, B 9b, middle

Kramer Cave, Falcon Hill, Nevada: Shutler, Rozaire and Shutler, n.d.

Hidden Cave, Fallon, Nevada: Grosscup 1956:58

Comment: The stem is not as prominent on this specimen as on type 9 points.

Type: 9b (Pl. 22, *aa)* **No. of Specimens**: 1

Form: Stemmed form; leaf-shaped blade with weak, rounded shoulder, straight stem, convex base; blade edge — convex; cross-section — strongly lenticular.

Technique: Rather shallow broad flakes were removed from both faces. The technique appears to have been well controlled pressure flaking.

Size Range: 3.9 x 2.0 x 0.8 cm.

Material: Ignimbrite

Distribution: Oe-156

Comparable Types: None

Comment: A variant of type 9.

Type: 10 (Pl. 22, *bb)* **No. of Specimens**: 2

Form: Stemmed form; medium sized isosceles triangular outline with slight notches near base; blade edge—convex; cross-section—lenticular; flaking—regular, medium to broad; base —straight (striking platform). At base slight side notches are evident. These make a sort of small short stem.

Technique: A slightly curving flake was chosen for these specimens. The striking platform at the base was left unaltered. The specimens exhibit over-all flaking on both faces. Slight side notches occur near base.

Size Range: 3.5-4.3 x 1.7-2.0 x 1.5-1.7 cm.

Material: Obsidian and ignimbrite

Distribution: Oe-145, Hu-17

Comparable Types: This provisional type is represented by only two pipeline specimens. They may be fragmentary side-notched points, however, one point fragment from the Hidden Cave, Nevada (Grosscup 1956: 58) collection is identical to the pipeline specimens.

Comment: Possibly flake knives or large side-notched points with base broken at the notches.

Type: 11 (Pl. 22, *cc)* **No. of Specimens**: 1

Form: Stemmed form; leaf-shaped blade with rounded stem; blade edge — convex; cross-section — concave; flaking, regular, medium; base—stemmed form with rounded stem.

Technique: Ventral or concave face retouched only around edges. The other face exhibits moderately well controlled over-all flaking.

Size Range: 3.3 x 1.4 x 0.5 cm.

Material: Obsidian

Distribution: Hu-17

Comparable Types: Wilson Butte Cave, Idaho, Type 13, Assemblage VI, Dietrich phase: Gruhn 1961a: 71, Plate 14, Z

Idaho point type 53: Swanson, Tuohy, and Bryan 1959: 19

Black Rock Cave: Steward 1937, Fig. 47, 1

Roaring Springs Cave Type 2: Cressman, Williams, and Krieger 1940, Fig. 10, Specimen 1-8165

Kawumkan Springs Type 2b: Cressman 1956, Fig. 45

Deer Creek Cave, Nevada, Type 9a: Shutler and Shutler, n.d.

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58f

Site I, Falcon Hill, Nevada: Shutler, Rozaire and Shutler, n.d.

Type: 11a (Not illustrated) **No. of Specimens**: 2

Form: Stemmed form; asymmetrical leaf-shaped blade with rounded stem; blade edge—convex; cross-section — lenticular; flaking — regular, medium; base — stemmed form with rounded base; stem not centered on blade.

Technique: Made on a flake; chipping not too well controlled.

Size Range: 3.1-3.4 x 1.4-2.3 x 0.3-0.6 cm.

Material: Obsidian

Distribution: Hu-17, Hu-21

Comparable Types: None

Comment: Possibly an erratic form or variety of type 11.

Type: 12 (Pl. 22, *dd)* **No . of Specimens**: 1

Form: Lanceolate, stemmed form with indented base; blade edge—convex; cross-section — lenticular; flaking — regular, fine, oblique parallel; stem—expanding; base—concave.

Technique: A very fine example of well controlled flaking. Over-all chipping in the oblique parallel technique in evidence upon both faces.

Size Range: 4.7 x 1.5 x 0.5 cm.

Material: Obsidian

Distribution: El-56

Comparable Types: May be a variant of McKean point: Kehoe 1955: 18, Fig. 4E

Comment: This point was associated with Feature 1, a fire hearth area at Site El-56.

Type: 13 (Pl. 22, *ee)* **No. of Specimens**: 2

Form: Stemmed form; small asymmetrical leaf-shaped points with one barb; blade edge—convex; cross-section—plano-convex; flaking—regular, fine to medium; stem—asymmetrical; base—convex.

Technique: These are made on plano-convex flakes. Planar faces are retouched only on edges. Over-all flaking present on convex face.

Size Range: 2.5-2.8 x 1.6-1.8 x 0.4-0.45 cm.

Material: Chalcedony, obsidian

Distribution: Oe-145, Oe-148

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 133, Fig 7, c

Deer Creek Cave, Nevada, Type 13: Shutler and Shutler, n.d.

Comment: Possibly unfinished corner-removed point form.

Type: 13a (Pl. 22, *ff)* **No. of Specimens**: 1

Form: Stemmed form; small asymmetrical leaf-shaped point with side notch and indented base; blade edge—convex; cross-section— lenticular; flaking — irregular, broad, some step-flaking; base—indented or recurved.

Technique: Material probably difficult to work. Step flaking in evidence on one face.

Size Range: 2.7 x 1.8 x 0.6 cm.

Material: Basalt

Distribution: Oe-148

Comparable Types: Wagon Jack Shelter, Nevada, unnamed type: Heizer and Baumhoff 1961: 127, Fig. 5, i

Comment: This is another aberrant form

which probably represents a discard or an unfinished side-notched point.

Type: 14 (Pl. 22, *gg)* **No. of Specimens**: 3
Form: Stemmed form; small isosceles triangular blade, contracting blunt stem; blade edge — straight to slightly excurvate; cross-section—lenticular; flaking—medium to broad; stem—contracting, blunt; base—convex.
Technique: Moderately well controlled flaking. Specimens were made on flakes.
Size Range: 1.9+-2.5+ x 1.6-1.9 x 0.3-0.6 cm.
Material: Obsidian
Distribution: Oe-171, Hu-21, Hu-35
Comparable Types: Wilson Butte Cave, Idaho, Type 7b, Assemblage V: Gruhn 1961a: 60-61. Plate 13, v
26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4f
Hidden Cave, Nevada: Grosscup 1956: 58

Type: 14a (Pl. 22, *hh)* **No. of Specimens**: 1
Form: Stemmed form; small, broad, triangular blade, contracting blunt stem; blade edge —straight; cross-section—lenticular; flaking—regular, medium; stem — contracting, blunt; base—convex.
Technique: Moderately well controlled flaking technique. Many shallow broad flaking scars.
Size Range: 2.6 x 2.3+ x 0.4 cm.
Material: Obsidian
Distribution: Hu-17
Comparable Types: None
Comment: The shape of the base and stem is reminiscent of those on Gypsum Cave points.

Type: 14b (Pl. 22, *ii)* **No. of Specimens**: 1
Form: Stemmed form; small broad triangular blade, expanding stem, narrower than blade; blade edge — slightly convex; cross-section — lenticular; flaking — regular, medium; stem — prominent, expanding; base—convex.
Technique: Some problems were encountered in reducing one face of this specimen; it exhibits step flaking.
Size Range: 2.8 x 2.55 x 0.5 cm.
Material: Obsidian
Distribution: Hu-17
Comparable Types: Mono County, California, Type 8: Meighan 1955, Plate 3, no. 31
26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4, j

Comment: A variant of sub-type 17c. Resembles Silver Lake type from Lake Mohave: Wormington 1957: 161, Fig. 54

Type: 14c (Pl. 22, *jj)* **No. of Specimens**: 11
Form: Stemmed form; small triangular blade, contracting or straight stem, straight base; blade edge—slightly convex; cross-section —lenticular; flaking—regular, medium; stem—contracting to straight; base — straight to diagonal.
Technique: The chipping technique appears rather crude for such small points.
Size Range: 1.6-2.3 x 1.2-1.5 x 0.2-0.45 cm.
Material: Ignimbrite, chalcedony, obsidian
Distribution: Oe-135, Oe-142, Oe-145, Oe-168, Oe-169, Oe-170, Oe-171, Hu-17, Hu-21, Hu-39, Pe-67
Comparable Types: Hidden Cave, Nevada: Grosscup 1956: 58
Comment: These are separated from other type 14 points on the basis of smaller size.

Type: 15 (Pl. 23, *a)* **No. of Specimens**: 3
Form: Stemmed form; small, broad, triangular blade, contracting stem, slightly concave base; blade edge—straight; cross-section—lenticular; flaking — regular, broad; stem — contracting; base—slightly concave.
Technique: Dorsal face of one specimen lacks over-all retouching. The other exhibits over-all pressure retouching resulting in removal of rather broad shallow flakes. A corner-removed point type.
Size Range: 2.0+-2.35+ x 1.8-2.35 x 0.45-0.5 cm.
Material: Ignimbrite, obsidian, basalt
Distribution: Oe-144, Hu-19, Hu-39
Comparable Types: None

Type: 15a (Pl. 23, *b)* **No. of Specimens**: 1
Form: Stemmed form with lanceolate blade, contracting stem, straight base; blade edge—convex; cross-section — lenticular; flaking — regular, narrow; stem — contracting; base — straight.
Technique: Made on a flake with parallel oblique flaking in evidence on one face.
Size Range: 1.5+ x 1.6 x 0.4 cm.
Material: Obsidian
Distribution: Hu-44
Comparable Types: None
Comment: Possibly a variant of type 15 point.

Type: 16 (Pl. 23, *c)* **No. of Specimens**: 4

Form: Stemmed form; small triangular blade, expanding stem, recurved; blade edge—straight to slightly convex; cross-section—plano-convex and lenticular; flaking—regular, medium; stem—slightly expanding; base—recurved or indented.

Technique: Technique was moderately well controlled. Diagnostic value seems to revolve around basal thinning which resulted in recurved or indented base. One specimen from Oe-69 is a basal fragment. Specimen from Oe-145 was made on a plano-convex flake.

Size Range: 2.7-2.5+ x 1.8-2.0 x 0.35-0.5 cm.

Material: Obsidian, ignimbrite, chalcedony

Distribution: Oe-145, Oe-169, Hu-17, Hu-39

Comparable Types: Idaho point type 49 (?): Swanson, Tuohy, and Bryan 1959: 18

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58, c

Comment: These specimens could be variants of stemmed indented base points.

Type: 17 (Pl. 23, *d)* **No. of Specimens**: 3

Form: Stemmed form; small triangular blade, expanding stem, wider than blade; blade edge—straight to slightly convex; cross-section—plano-convex and lenticular; flaking—regular, medium; stem—expanding and wider than blade; base—convex.

Technique: These were made on small flakes; chipping technique was moderately well controlled, but one face of each specimen exhibits irregular flaking.

Size Range: 1.6-1.85 x 1.75-1.85 x 0.4-0.5 cm.

Material: Obsidian

Distribution: Oe-145, Oe-169, Hu-19

Comparable Types: None

Type: 17a (Pl. 23, *e)* **No. of Specimens**: 2

Form: Stemmed form; small leaf-shaped blade, expanding stem, wider than blade; blade edge—convex; cross-section—lenticular; flaking—regular, medium; stem expanding and wider than blade; base—concave.

Technique: These were made on flakes. The base shows thinning which perhaps accounts for concave form.

Size Range: One basal fragment. The complete specimen lacks a tip.

1.95+ x 1.7 x 0.4 cm.

Material: Obsidian, chalcedony

Distribution: Oe-169, Oe-170

Comparable Types: Huntington Lake Region, California: Hindes 1962, Plate 1, A, n

Deer Creek Cave, Nevada, Type I i: Shutler and Shutler, n.d.

Type: 17b (Pl. 23, *f)* **No. of Specimens**: 3

Form: Stemmed form: small broad triangular blade, expanding stem, as wide as blade; blade edge—straight to slightly convex; cross-section—lenticular; flaking—regular, medium to broad; stem—expanding and as wide as blade; base—convex.

Technique: Rather thick flakes were chosen for these specimens. Vertical flakes were removed from the bases, and wide notches are in evidence along sides.

Size Range: Two are basal fragments; the third measures 2.6+ x 2.0 x 0.5 cm.

Material: Chalcedony, obsidian, ignimbrite

Distribution: Oe-170, Oe-171, Hu-39

Comparable Types: Huntington Lake Region, California: Hindes 1962, Plate 1, B, j

Comment: These might be considered "corner-removed" points.

Type: 17c (Pl. 23, *g)* No. of Specimens: 8

Form: Stemmed form; small broad triangular blade, expanding stem, as wide or wider than blade, prominent convex base; blade edge straight to slightly excurvate; cross-section—plano-convex to lenticular; flaking—regular, medium to broad; stem—prominent, expanding; base—convex.

Technique: These were made on flakes. Planar faces of plano-convex specimens lack over-all flaking.

Size Range: 2.4-2.85 x 2.1-2.9 x 0.4-0.5 cm.

Material: Obsidian (5), green aphantic mineral.

Distribution: Elk-32, Hu-17 (4), Hu-18, Hu-39 (2)

Comparable Types: Mono County, California, Type 8: Meighan 1955, Plate 3, no. 32

Huntington Lake Region, California: Hindes 1962, Plate 1, B, k

Deer Creek Cave, Nevada, Type 17: Shutler and Shutler, n.d.

Comment: Some variability in outline.

Type: 18 (Pl. 23, *h)* **No. of Specimens**: 3

Form: Stemmed form; small isosceles triangular blade, rounded shoulder, expanding

stem, concave base; blade edge—straight to slightly concave; cross-section — lenticular; flaking — regular, medium; stem — expanding and as wide as blade; base—concave.

Technique: Moderately well controlled flaking. Broad shallow flakes removed from base.

Size Range: 2.3-2.6 x 1.3-1.4 x 0.4 cm.

Material: Obsidian, ignimbrite

Distribution: El-62, Oe-169, Hu-31

Comparable Types: Wilson Butte Cave, Idaho, Type 10a, Assemblage VI; Gruhn 1961a: 66-67, Plate 14, M, N

Idaho point type 77: Swanson, Tuohy, and Bryan 1959: 25

Pence-Duerig Cave point type 11: Gruhn 1961b, Fig. 2, Q, S.

Birdshead Cave: Bliss 1950, Fig. 58, top U, IV, nos. 2 and 3

Pictograph Cave point type 7: Mulloy 1958, Fig. 6, 34-50; Fig 25, 8-10

Turner-Look site (Fremont) Type B: Wormington 1955, Fig. 32

Promontory Caves: Steward 1937, Fig. 4e

Western Utah point type 1B1: Rudy 1953, Fig. 32, b

Roaring Springs Cave: Cressman, Williams, and Krieger 1940, Fig. 10, Specimen 1-3517

Karlo Site 5b (small): Riddell 1960, Fig. 5, Pl. 2A, 56

Desert Side-notched (General): Baumhoff and Byrne 1959, Pl. 1, a, c

4-Iny-2, Owens Valley, California, Type 7: Riddell 1951, Fig. 1, 7

Type: 18a (Pl. 23, *i)* **No. of Specimens**: 1

Form: Stemmed form; small, asymmetrical triangular blade, expanding stem, straight base; blade edge—slightly concave; cross-section—plano-convex; flaking—regular, narrow; stem — expanding and placed off center; base — straight.

Technique: Made on a flake with rather broad, shallow flaking scars on planar face and narrow regular scars on dorsal face.

Size Range: 2.75 x 1.9 x 0.5 cm.

Material: Obsidian

Distribution: El-58

Comparable Types: El Portal, California: Fitzwater and Van Vlissingen 1960, Plate II, 14

Comment: Possibly a variety of point type 18.

Type: 19 (Pl. 23, *j)* **No. of Specimens**: 1

Form: Stemmed form; large isosceles triangular blade, expanding stem, concave base; blade edge — straight; cross-section — plano-convex; flaking — regular, medium to broad; stem—expanding; base—concave.

Technique: Made on a flake. Ventral or planar face exhibits areas lacking over-all chipping.

Size Range: 3.8+ x 2.05 x 0.45 cm.

Material: Ignimbrite

Distribution: Hu-17

Comparable Types: Wilson Butte Cave, Idaho, Type 8e, Unplaced: Gruhn 1961a: 63-64, Fig. 14, F

Comment: This type is identical with the Wilson Butte Cave specimen.

Type: 20 (Pl. 23, *k)* **No. of Specimens**: 2

Form: Stemmed form; broad leaf-shaped blade; contracting stem, concave base; blade edge—convex to straight; cross-section—plano-convex; flaking—regular, medium; stem—narrow, contracting; base—concave.

Technique: Both specimens were made on plano-convex flakes. Planar faces show partial retouch around edges.

Size Range: 3.0-3.5 x 2.25-2.85 x 0.45 cm.

Material: Obsidian

Distribution: El-51, Pe-67

Comparable Types: Wagon Jack Shelter, Nevada: Elko Contracting-Stem: Heizer and Baumhoff 1961: 125, Fig. 3, v

Ruby Cave, Nevada: Baumhoff n.d., Type VI, bottom row, second from right

Type: 21 (Pl. 23, *l)* **No. of Specimens**: 8

Form: Stemmed form; small, triangular blade, corner notches, expanding stem, straight base; blade edge—straight to slightly excurvate; cross-section — lenticular; flaking — regular, medium; stem—expanding, broad; base—straight.

Technique: These are "corner notched" points with notches at less than 90° angle. Over-all chipping is present on both faces of all specimens.

Size Range: 1.8+ x 2.4+ x 2.05-2.5 x 0.4-0.5 cm.

Material: Obsidian (6), Ignimbrite (2)

Distribution: El-58, Oe-172, Hu-17 (6)

Comparable Types: Wagon Jack Shelter, Nevada, Eastgate Expanding-stem: Heizer and Baumhoff 1961: 124, Fig. 2, h

Type 6, Mono County, California: Meighan 1955, Plate 3, no. 21

Site 10-AA-15, Idaho: Tuohy and Swanson 1960, Fig. 1, no. 54

Idaho point type 54: Swanson, Tuohy and Bryan 1959: 19

Stuart Rockshelter, "corner notched, Pueblo level": Shutler, Shutler and Griffith 1960: 33, Plate 7, b

Karlo Site, type 3a: Riddell 1960, Plate 2, A, 3a

Huntington Lake Region, California: Hindes 1962, Plate 1, A, x

El Portal, California: Fitzwater and Van Vlissingen 1960, Plate II, 23-28

Deer Creek Cave, Nevada, Type 3b: Shutler and Shutler, n.d.

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58, e

Type: 21a (Pl. 23, *m)* **No. of Specimens**: 2

Form: Stemmed form; triangular blade, elongated expanding stem, straight base; blade edge—straight to slightly convex; cross-section —lenticular; flaking—regular, medium; stem —elongated expanding; base—straight.

Technique: These are narrow stemmed forms with the shoulder at a 90° angle. Over-all chipping on both faces.

Size Range: One specimen, 3.2 x 2.2 x 0.4 cm.

Material: Obsidian

Distribution: Hu-17, Hu-21

Comparable Types: Wagon Jack Shelter, Nevada: Elko Corner-notched: Heizer and Baumhoff 1961: 125, Fig. 3

Huntington Lake Region, California: Hindes 1962, Plate 1, a, v

Deer Creek Cave, Nevada, Type 8k: Shutler and Shutler, n.d.

Comment: This is probably a "corner notched" point type with very broad notches creating the elongated stem.

Type: 21b (Pl. 23, *n)* **No. of Specimens**: 5

Form: Stemmed form; isosceles triangular blade, broad corner notches, expanding, narrow stem, straight base; blade edge—straight to slightly excurvate; cross-section — lenticular; flaking—regular, narrow to medium.

Technique: Over-all moderately well controlled pressure flaking is in evidence on both faces. Basal thinning was attempted. Corner notches have created a 90° shoulder.

Size Range: 1.7-3 x 1.2-2.1 x 0.35-0.55 cm.

Material: Obsidian (4), ignimbrite (1)

Distribution: Oe-142, Hu-17, Hu-19, Hu-21, Hu-40

Comparable Types: Stahl Site (Pinto), "nontypical point": Harrington 1957: 55, Fig. 41, center, third row

26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4, k

Huntington Lake Region, California: Hindes 1962, Plate 1, B, p-r

Deer Creek Cave, Nevada, Type 5e: Shutler and Shutler, n.d.

Type: 21c (Pl. 23, *o)* **No. of Specimens**: 8

Form: Stemmed form; broad triangular blade, corner notches, expanding stem, concave base; blade edge—straight to slightly excurvate; cross-section — lenticular; flaking — regular, narrow to medium; stem — expanding, broad; base—concave.

Technique: These are all well-made points. The "corner notches" are at less than a 90° angle.

Size Range: Two complete specimens—2.5-4.8 x 2.2-2.7 x 0.4-0.7 cm.

Material: Chert, chalcedony, basalt, obsidian (4)

Distribution: El-54, Oe-138, Oe-145, Hu-17 (3), Hu-21 (2)

Comparable Types: Wagon Jack Shelter, Nevada: Elko Eared: Heizer and Baumhoff 1961: 126, Fig. 4, t

Eastgate Cave, Nevada: Elsasser and Prince 1961: 145, Plate 25, O

Lovelock Cave, Nevada, Type II: Grosscup 1960, Fig. 5, bottom row, left

Type: 21d (Pl. 23, *p)* **No. of Specimens**: 1

Form: Stemmed form; asymmetrical blade, expanding stem as wide as blade, concave base; blade edge — irregular; cross-section — plano-convex; flaking — regular, narrow; stem — expanding to width of blade; base—concave.

Technique: Made on a curving flake. The planar face exhibits retouching on edges only.

Size Range: 3.0 x 1.8 x 0.3 cm.

Material: Obsidian

Distribution: Hu-37

Comparable Types: Wagon Jack Shelter,

Nevada: Elko Corner-notched: Heizer and Baumhoff 1961: 125, Fig. 3, n

Deer Creek Cave, Nevada, Type 5a: Shutler and Shutler, n.d.

Comment: Probably an erratic corner-notched point.

Type: 21e (Pl. 23, *q)* **No. of Specimens**: 3

Form: Stemmed form; broad triangular blade, broad expanding stem, convex base; blade edge—straight to slightly convex; cross-section—lenticular; flaking—regular, medium; stem—broad, expanding; base—convex.

Technique: This is another "Corner-notched" form. The chipping was moderately well controlled.

Size Range: No complete specimens. Nearly complete specimen measures: 2.5+ x 2.85 x 0.45 cm.

Material: Chert, chalcedony, obsidian

Distribution: Hu-17, Pe-67

Comparable Types: Wilson Butte Cave, Idaho, Type 11d, Assemblage V: Gruhn 1961a: 69, Plate 14, T

Idaho point type 62: Swanson, Tuohy, and Bryan 1959: 21

Pence-Duerig Cave point type 9: Gruhn 1961b, Fig. 2, K

Birdshead Cave: Bliss 1950, Fig. 58, Top L IV

Pictograph Cave point type 6: Mulloy 1958, Fig. 6, nos. 17, 23

Deadman Cave Type I: Smith 1952, Fig. 4, A

Karlo Site Type 3 a-c: Riddell 1960, Fig. 5, Pl. 2, A, 3 a-c

Deer Creek Cave, Nevada, Type 3 b: Shutler and Shutler, n.d.

Type: 22 (Pl. 23, *r)* **No. of Specimens**: 2

Form: Stemmed form; medium sized isosceles triangular blade, broad expanding stem as wide as blade, concave base; blade edge—slightly convex; cross-section — lenticular; flaking — regular, medium; stem — broad, expanding; base—concave.

Technique: These were made on flakes. Both have "broad" angle shoulders of more than 90°.

Size Range: 2.9+-3.35+ x 2.0-2.1 x 0.45-0.5 cm.

Material: Obsidian

Distribution: Oe-169, Hu-17

Comparable Types: Wagon Jack Shelter, Nevada: Elko Eared: Heizer and Baumhoff 1961: 126, Fig. 4, n

Deer Creek Cave, Nevada, Type 1: Shutler and Shutler, n.d.

Comment: Except for the elongated shape of the blade, these could be combined with variety 22a. Both are varieties of "eared" points.

Type: 22a (Pl. 23, *s)* **No. of Specimens**: 3

Form: Stemmed form; small equilateral triangular blade, prominent expanding stem and concave base; blade edge—straight, serrated; cross-section — lenticular; flaking — regular, narrow to medium; stem—broad, expanding; base—concave, recurved.

Technique: Well controlled technique. Large side and basal concavities indicate superior workmanship.

Size Range: 2.75-3.0 x 1.95-2.15 x 0.4-0.45 cm.

Material: Obsidian

Distribution: Hu-17, Hu-21, Hu-31

Comparable Types: Wagon Jack Shelter, Nevada: Elko Corner-notched: Heizer and Baumhoff 1961, Fig. 3, q

Karlo Site, Type 2c: Riddell 1960, Plate 2, 2c

Ruby Cave, Nevada: Baumhoff n.d., Type V, top row, right.

Comment: Together with variety 22, these form a distinctive group of side-notched points.

Type: 23 (Pl. 23, *t)* **No. of Specimens**: 6

Form: Stemmed form; small to medium broad triangular blade, expanding stem and recurved base; blade edge — convex; cross-section—lenticular; flaking—regular, medium; stem—expanding; base—recurved.

Technique: The shoulder of these points is at an agle of less than 90°. Side notches are deep and wide creating medium sized symmetrical barbs. Chipping technique was moderately well controlled.

Size Range: 1.45-2.2+ x 1.6-2.3 x 0.3-0.5 cm.

Material: Obsidian (5), chalcedony

Distribution: El-56, Oe-145, Oe-169, Elk-29, Hu-17

Comparable Types: Wilson Butte Cave, Idaho, Type 12b, Assemblage VI: Gruhn 1961a: 70-71, Plate 14, W

Idaho point types 91, 55: Swanson, Tuohy, and Bryan 1959: 29, 19

Pence-Duerig Cave point type 10c: Gruhn 1961b, Fig. 2, N-P

Promontory Cave No. 1: Steward 1937, Fig. 4a

Danger Cave W-37: Jennings 1957: 129

Deadman Cave Type II: Smith 1952, Fig. 4, B-1, 5, 6

Turner-Look Site (Fremont) Type C: Wormington 1955, Fig. 32, below

Garrison Site Type 1b: Taylor 1954: 45, Fig. 20, b, top row

4-Iny-2 (Owens Valley, California) Type 11: Riddell 1951, Fig. 1, 11

26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4, m

Huntington Lake Region, California: Hindes 1962, Plate 1, B, t

Deer Creek Cave, Nevada, Type 8a: Shutler and Shutler, n.d.

Type: 23a (Pl. 23, *u)* **No. of Specimens**: 2

Form: Stemmed form; small triangular blade, expanding stem, rounded base; blade edge—straight; cross-section—lenticular; flaking — regular, narrow to medium; stem — expanding; base—rounded.

Technique: One specimen was made on a small flake of suitable shape. The other exhibits well controlled pressure or indirect percussion scars.

Size Range: 1.5-1.7+ x 1.35-1.5 x 0.25-0.3 cm.

Material: Ignimbrite, chalcedony

Distribution: El-55, Oe-171

Comparable Types: See distribution of type 23.

Deer Creek Cave, Nevada, type 2a: Shutler and Shutler, n.d.

Comment: A variety of type 23 point.

Type: 23b (Pl. 23, *v)* **No. of Specimens**: 1

Form: Stemmed form; isosceles triangular blade, expanding stem, rounded base; blade edge—slightly convex; cross-section—diamond; flaking — regular, narrow; stem — expanding, narrower than blade; base—rounded.

Technique: This point was made on a flake. Moderately well controlled flaking technique removed flakes from all edges creating a diamond shaped cross-section. Slight lateral twist to point.

Size Range: 3.2 x 1.2 x 0.3 cm.

Material: Chalcedony

Distribution: Pe-77

Comparable Types: Deer Creek Cave, Nevada, Type 8: Shutler and Shutler, n.d.

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58 n

Site A, Falcon Hill, Nevada: Shutler, Rozaire and Shutler, n.d.

Comment: Possibly a variant of point group 23a.

Type: 23c (Pl. 23, *w)* **No. of Specimens**: 2

Form: Stemmed form; small triangular blade, narrow angle (less than 90°) shoulder, rounded to slightly rounded base; blade edge — slightly convex; cross-section — lenticular; flaking — regular, narrow; stem — expanding; base—convex to slightly convex.

Technique: These are both well-made specimens.

Size Range: 2.35-2.6 x 1.3-1.65 x 0.3-0.4 cm.

Material: Obsidian, chert

Distribution: Oe-151, Hu-26

Comparable Types: Lovelock Cave, Nevada, Specimen 1-19205: Loud and Harrington 1929, Plate 56, K

Lovelock Cave, Nevada Type III, Specimen 13-4777: Grosscup 1960, Fig. 5

Mono County, California, Type 7: Meighan 1955, Plate 3, nos. 29, 30

Huntington Lake Region, California: Hindes 1962, Plate 1, B, t

Deer Creek Cave, Nevada, Type 8b: Shutler and Shutler, n.d.

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58p

Humboldt Cave, Nevada: Heizer and Krieger 1956, Plate 14e

Type: 24 (Pl. 23, *x)* **No. of Specimens**: 7

Form: Stemmed form; small triangular blade, expanding stem, convex or straight base; blade edge—straight; cross-section—lenticular; flaking—regular, narrow to medium; stem—expanding; base—convex and straight.

Technique: These specimens exhibit moderately well controlled pressure flaking.

Size Range: 2.1+-3.4+ x 1.9-2.0 x 0.3-0.45 cm.

Material: Chalcedony (2), obsidian (3), ignimbrite

Distribution: Oe-145, Elk-29, Elk-41, Hu-17 (3), Hu-19

Comparable Types: Idaho point types 55, 91:

Swanson, Tuohy, and Bryan 1959: 19, 29

Wilson Butte Cave, Idaho, Type 12c: Assemblage VI, Dietrich Phase: Gruhn 1961a, 70-71, Plate 14, X, Y

Pence-Duerig Cave, Idaho, Type 10c: Gruhn 1961b, Fig. 2, 0

Danger Cave, Type W-37: Jennings 1957, 129

Promontory Cave no. 1: Steward 1937, Fig. 4 a

Deadman Cave Type II: Smith 1952, Fig. 4, B-1, 5, 6

Lovelock Cave Type IV: Grosscup 1960, Fig. 5, No. 13-4777e

Type 5, Mono County, California: Meighan 1955, Plate 3, no. 15

Comment: These specimens are probably all corner-notched points. The chalcedony specimen from Elk-41 has a very thick patina which obscures flaking scars.

Type: 24a (Pl. 23, *y)* **No. of Specimens**: 2

Form: Stemmed form; isosceles triangular blade with convex edges, expanding stem, rounded base; blade edge — convex; cross-section—plano-convex; flaking—regular, medium to broad; stem—expanding; base—rounded.

Technique: Plano-convex flakes were partially retouched around edges to create these points. Over-all flaking is lacking on both faces. Barbs form angle of less than 90° at shoulder.

Size Range: 2.7+-3.55+ x 1.85-2.0 x 0.25-0.65 cm.

Material: Obsidian

Distribution: Hu-21, Pe-75

Comparable Types: Wagon Jack Shelter, Nevada, Rose Spring Corner-notched: Heizer and Baumhoff 1961: 124, Fig. 2d

Comment: Similar to type 23b in outline.

Type: 24b (Pl. 23, *z)* **No. of Specimens**: 1

Form: Stemmed form; isosceles triangular blade, slightly convex blade edge, expanding stem, thick, convex base; blade edge—slightly convex; cross-section — lenticular; flaking — regular, narrow to medium; stem—expanding; base—thick, slightly convex.

Technique: The shoulder is set at an angle of less than 90°. Striking platform for flake forms base. Over-all well controlled flaking is in evidence.

Size Range: 3.1 x 1.8 x 0.4 cm.

Material: Chalcedony

Distribution: Elk-27

Comparable Types: Wagon Jack Shelter, Nevada; Rose Spring Corner-notched: Heizer and Baumhoff 1961: 124, Fig. 2, e

Huntington Lake Region, California: Hindes 1962, Plate 1, B, u

Deer Creek Cave, Nevada, Type 8e: Shutler and Shutler, n.d.

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58, o

Comment: A variety of "corner notched" point with slightly serrated blade edges.

Type: 25 (Pl. 23, *aa)* **No. of Specimens**: 8

Form: Stemmed form, small to large isosceles triangular blades, deep corner notches, expanding stems, recurved bases; blade edges — straight to slightly excurvate; cross-section—plano-convex and lenticular; stem—narrower than blade and expanding; base—recurved or slightly concave.

Technique: Two specimens (Oe-169 and Hu-21) have one planar face retouched around edges only. The remainder show over-all chipping on both faces. Shoulder creates angle of less than 90°.

Size Range: Size varies considerably: 1.5+ -3.6+ x 1.5-2.7 x 0.3-0.5 cm.

Material: Obsidian

Distribution: Oe-169, Hu-17 (2), Hu-19, Hu-21 (2552—isolated find), Hu-39, Pe-67

Comparable Types: Wagon Jack Shelter, Nevada; Elko Corner-notched: Heizer and Baumhoff 1961: 125, Fig. 3, t

Huntington Lake Region, California: Hindes 1962, Fig. 1, B, v

Deer Creek Cave, Nevada, Type 6c: Shutler and Shutler, n.d.

Type: 26 (Pl. 23, *bb)* **No. of Specimens**: 1

Form: Stemmed form; small broad triangular blade, contracting stem, doubly recurved base; blade edge—slightly convex; cross-section —lenticular; flaking—regular, narrow; stem—contracting, narrow; base—doubly recurved.

Size Range: Basal fragment. 1.4+ x 1.5 x 0.35 cm.

Material: Chalcedony

Distribution: Oe-169

Comparable Types: None. Possibly an erratic form.

Comment: Found on butte top site in association with rock alignments.

Type: 27 (Pl. 23, *cc)* **No. of Specimens**: 2

Form: Stemmed form; miniature points; very small stemmed form, small triangular blade, elongated expanding stem, convex base; blade edge — straight; cross-section — plano-convex; flaking — regular, narrow; stem — expanding; base—convex.

Technique: A very small flake was carefully retouched to produce this miniature point. Shoulder creates a broad angle of more than 90°.

Size Range: 1.1-1.2 x 0.7-0.9 x 0.2-0.21 cm.

Material: Obsidian

Distribution: Oe-145, Oe-152

Comparable Types: Site 10-AA-15, Idaho: Tuohy and Swanson 1960: 21, Fig. 1, no. 52

Idaho point type 52: Swanson, Tuohy and Bryan 1959: 18

Comment: See also type 1c, and type 35c, for points of comparable size. The Idaho specimens listed above are both larger than pipeline specimens.

Type: 28 (Pl. 23, *dd)* **No. of Specimens**: 1

Form: Stemmed form; small triangular blade, long expanding stem, concave base; blade edge — slightly convex; cross-section — lenticular; flaking — regular, broad; stem — long. expanding; base—concave.

Technique: This probably is an aberrant form. The flaking scars are rather broad and deep for such a small point.

Size Range: 2.0+ x 1.3 x 0.5 cm.

Material: Ignimbrite

Distribution: Oe-150

Comparable Types: None; possibly an erratic form.

Type: 29 (Pl. 23, *ee)* **No. of Specimens**: 7

Form: Stemmed form; "Desert Side-notched, Sierra Sub-type"; small triangular blade, small side notches and a single basal notch; blade edge—straight to slightly convex; cross-section —lenticular verging on plano-convex; flaking — regular, narrow; stem — as wide as blade, expanding; base — concave with prominent notch.

Technique: Well controlled pressure flaking.

Size Range: 1.6-2.15 x 1.0-1.2 x 0.25-0.35 cm.

Material: Chalcedony (6), obsidian (1)

Distribution: El-53 (2), El-56, El-57, Oe-141, Oe-145, Oe-148

Comparable Types: Site G, Falcon Hill, Nevada: Shutler, Rozaire and Shutler, n.d.

Wilson Butte Cave, Type 10b, Assemblage VI: Gruhn 1961a: 67, Plate 14, o, p

Huntington Lake Region, California: Hindes 1962, Plate 1, A, O-n

Idaho point type 83: Swanson, Tuohy and Bryan: 1959: 27

Birdshead Cave: Bliss 1950, Fig. 58, top, u, v, nos. 1 & 2; u vi, 1-5

Pictograph Cave point type 8: Mulloy 1958, Fig. 23, no. 10; Fig. 25, nos. 1-6

Promontory Cave no. 1: Steward 1937, Fig. 4i

Roaring Springs Cave Type 5: Cressman, Williams, and Krieger 1940, Fig. 10

Karlo Site type 5c (small): Riddell 1960, Fig. 5, Pl. 2, 5c

Death Valley IV: Hunt 1960, Fig. 62, d, r, x

Desert Side-notched (Sierra sub-type): Baumhoff and Byrne 1959, Pl. 1, g-k

4-Iny-2, Owens Valley, California, Type 8: Riddell 1951, Fig. 1, 8

Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 125, Fig. 3, a, c

Mohave Desert, California: Rogers 1939, Plate 18, q, r

Mono County, California, Type 11: Meighan 1955, Plate 3, no. 40

Deer Creek Cave, Nevada, Type 1 r: Shutler and Shutler, n.d.

Comment: Only one Desert Side-notched, Sierra sub-type point is obsidian, the other six are chalcedony. In the University of California collections studied by Baumhoff and Byrne (1959: 33), obsidian side-notched points occur in the proportion of 3:1 over other materials, actually .7409% (obsidian) to .2591% (other materials). Note too, the rather surprising distribution of this sub-type along the pipeline route. They were found only in Idaho, in Elmore County and Owyhee County. However, the type is widespread along the western periphery of the Basin.

Type: 29a (Pl. 23, *ff)* **No. of Specimens**: 8

Form: Stemmed form; medium-sized triangular blade, large side notches, and a basal notch; blade edge — slightly convex; cross-section — lenticular; flaking—regular, medium; stem—expanding with deep side notches; base — straight to convex with deep notch.

Technique: These are very well-made points. It appears that the notches were flaked after a broad lanceolate "blank", with maximum width near lower 1/3 of blade, was brought to shape.

Size Range: Four are bases (not measured). 2.8-3.35 x 1.45-1.85 x 0.4-0.45 cm.

Material: Obsidian

Distribution: El-58, Oe-149, Oe-169, Oe-171 (2), Elk-29, Pe-67

Comparable Types: Wilson Butte Cave, Idaho, Assemblage IV: Gruhn 1961a: 65, Plate 14, H

Danger Cave W-28: Jennings 1957: 122

Promontory Cave no. 1: Stewart 1937, Fig. 4 c

Deer Creek Cave, Nevada, Type 10: Shutler and Shutler, n.d.

Comment: These points are similar in all respects to sub-type 29 specimens, but they are larger.

Type: 30 (Pl. 23, *gg)* **No. of Specimens**: 2

Form: Stemmed form; blade smaller than stem, side notched, small leaf-shaped outline; blade edge — slightly convex; cross-section — lenticular; flaking—regular, medium; stem—expanding with deep side notches; base — straight to slightly concave.

Technique: These were apparently made in the same manner as type 29a specimens.

Size Range: 1.4-2.0 x 1.5-1.7 x 0.3-0.4 cm.

Material: Obsidian

Distribution: Oe-145

Comparable Types: Deer Creek Cave, Nevada, Type 1a: Shutler and Shutler, n.d.

Comment: Similar to sub-type 29a, except that notches are higher up on blade and base is not notched but is straight to slightly concave.

Type: 30a (Pl. 23, *hh)* **No. of Specimens**: 7

Form: Stemmed form; small leaf-shaped outline, side notches and deeply concave base; blade edge—convex; cross-section—lenticular; flaking—regular medium; stem—slightly narrower than blade, expanding; base — deeply concave.

Technique: Side notches were created in a blank having a leaf-shaped outline.

Size Range: Five are stems and bases. The nearly complete specimen measures: 1.8+ x 1.85 x 0.4 cm.

Material: Obsidan (6), chalcedony (1)

Distribution: Oe-140, Oe-171, Elk-27, Hu-19, Hu-21, Hu-30, Hu-44

Comparable Types: Karlo Site, Type 5 Lg: Riddell 1960, Plate 2, A, 5, Lg

Deer Creek Cave, Nevada, Types 1b, 1d: Shutler and Shutler, n.d.

Comment: Probably a variant of type 30, except that the side notches are placed lower on the point and they are directed toward the tip of the blade. This sub-type is called "Madeline Dune side-notched" by Riddell (1960: 18).

Type: 30b (Pl. 23, *ii)* **No. of Specimens**: 11

Form: Stemmed form; small to medium isosceles triangular blade, side notches, concave base; blade edge—straight; cross-section—lenticular; flaking—regular, narrow to medium; stem—as wide as blade; base—concave.

Technique: Well controlled pressure flaking.

Size Range: 1.6+-3.5 x 1.3-1.75 x 0.25-0.4 cm.

Material: Obsidian (5), ignimbrite (3), chalcedony (3)

Distribution: El-50, El-56, El-58, Oe-144, Oe-145, Oe-148, Oe-151 (2), Oe-170 (2), Oe-171

Comparable Types: Wilson Butte Cave, Idaho, Type 9c Assemblage IV: Gruhn 1961a: 65, Plate 14, I

Idaho point type 81: Swanson, Tuohy, and Bryan 1959: 26

Danger Cave Type W-26: Jennings 1957: 121

Roaring Springs Cave, Type 4: Cressman, Williams, and Krieger 1940, Fig. 10

Cougar Mountain Cave: Cowles 1959, Plate 5, far left

Kawumkan Springs, Type 7a: Cressman 1956, Chart 1: Fig. 45

Cold Springs Midden: Shiner 1954, Plate V, a

Karlo Site Type 5b, (large): Riddell 1960, Fig. 5

Huntington Lake Region, California: Hindes 1962, Plate 1, i, j

Deer Creek Cave, Nevada, Type 1f: Shutler and Shutler, n.d.

Comment: Similar to 30c in form.

Type: 30c (Pl. 23, *jj)* **No. of Specimens**: 7

Form: Stemmed form; small triangular blade, side notches, straight base; blade edge —straight to slightly convex; cross-section—plano-convex and lenticular; flaking—regular,

narrow to medium; stem—as wide as blade; base—straight.

Technique: All specimens made on flakes. Over-all flaking is lacking on specimens from El-56 and Oe-169.

Size Range: 1.55-2.6 x 1.4-1.5 x 0.3-0.4 cm.

Material: Obsidian (3), ignimbrite (4)

Distribution: El-56, Oe-145 (2), Oe-169 (2), Hu-44, Pe-67.

Comparable Types: Idaho point types 81: Swanson, Tuohy, and Bryan 1959: 26

Site 10-AA-15, Idaho: Tuohy and Swanson 1960, Fig. 1, 84

Wilson Butte Cave point type 9d, Assemblage IV and V: Gruhn 1961a: 66, plate 14, k-l

Pence-Duerig Cave, Idaho, Type 11: Gruhn 1961b: 3, Fig. 2, q-s

Promontory Caves: Steward 1937, Fig. 4 j

Cold Spring Midden: Shiner 1954, Plate V, b

Ruby Cave, Nevada, Baumhoff n.d., Type II

Deer Creek Cave, Nevada, Type 1j; Shutler and Shutler, n.d.

Type: 31 (Pl. 23, *kk)* **No. of Specimens:** 8

Form: Stemmed form; small to medium triangular blade, slight, broad angle (more than 90°) shoulder, straight to slightly expanding stem, concave base; blade edge—slightly convex; cross-section—thick, lenticular; flaking—medium to broad; stem—straight to slightly expanding; base—concave.

Technique. These are all rather thick specimens showing medium to broad flaking scars. A sub-type of Pinto point.

Size Range: 2.25-3.35 x 1.35-2.1 x 0.4-0.8 cm.

Material: Obsidian (4), ignimbrite (2)

Distribution: Oe-145 (2), Oe-151, Oe-171 (2). Hu-17, Hu-37, Hu-39

Comparable Types: Huntington Lake Region, California: Hindes 1962, Plate 1, B, g-i

Mono County, California, Type 10: Meighan 1955, Plate 3, no. 37

Lovelock Cave, Nevada, specimen 1-19202: Loud and Harrington 1929, Plate 56, n

Wilson Butte Cave, Idaho, Assemblage III: Gruhn 1961a: 61-62, Plate 14, A, B

Idaho point type 56: Swanson, Tuohy, and Bryan 1959: 19

Stemmed-indented Base points: Lister 1953: 265; Fig. 90

Pinto Type C: Hunt and Tanner 1960, Fig. 2, c; also Amsden 1935, Fig. 47, i

Stahl site (Pinto) sloping shoulders sub-type: Harrington 1957, Fig. 39, second row

Danger Cave type W-10: Jennings 1957: 110

Early Death Valley II: Hunt 1960, Fig. 24, g, i

Mulloy 1954b, Fig. 4, Lower level, 38

Karlo Site type 9e: Riddell 1960, Fig. 5; Plate 2, B, 9, e

Deer Creek Cave, Nevada, type 7: Shutler and Shutler, n.d.

Comment: Pinto points with sloping shoulders (Harrington 1957: 50, Fig. 39, second row), are identical to these pipeline specimens.

Type: 31a (Pl. 23, *ll)* **No. of Specimens:** 14

Form: Stemmed form; small to medium equilateral and isosceles triangular blade; narrow angle (less than 90°) shoulder, expanding stem, concave base; blade edge — straight to slightly convex; cross-section — lenticular and plano-convex; flaking—regular, medium; stem —notched or concave.

Technique: Well controlled flaking technique.

Size Range: 2.4-4.3 x 1.7-2.2 x 0.3-0.65 cm.

Material: Obsidian

Distribution: Oe-145, Oe-148, Hu-17 (3), Hu-21 (2), Hu-26 (2), Hu-35, Hu-39 (3), Pe-67

Comparable Types: Hidden Cave, Nevada: Grosscup 1956: 58

Deer Creek Cave, Nevada, Type 6a: Shutler and Shutler, n.d.

Wagon Jack Shelter, Nevada: Elko Eared: Heizer and Baumhoff 1961: 126, Fig. 4, q

Wilson Butte Cave, Idaho, Assemblage III: Gruhn 1961a: 62, Plate 14, C

Idaho point type 56: Swanson, Tuohy, and Bryan 1959: 12

Danger Cave Type W-31: Jennings 1957: 125

Karlo Site Type 3d: Riddell 1960, Fig. 5, Pl. 2, A, 3d

Humboldt Cave Type SCb2: Heizer and Krieger 1956, Pl. 14, k

Roaring Springs type 8: Cressman, Williams, and Krieger 1940: 46

Stahl Site (Pinto) barbed shoulder sub-type: Harrington 1957, Fig. 39, bottom row

26-Pe-5, Pershing County, Nevada: Elsasser 1958, Fig. 4, p

Mono County, California, Type 9: Meighan 1955, Plate 3, no. 35

Mono County, California, Type 10: Meighan 1955, Plate 3, no. 39

Site 10-AA-15, Idaho: Tuohy and Swanson 1960, 21, Fig. 1, No. 2

Comment: This group compares with Harrington's (1957: 50, Fig. 39, bottom row) "barbed shoulder" sub-type of Pinto Point, although the pipeline group includes some Pinto-like specimens which compare more favorably with Elko Eared points described by Heizer and Baumhoff (1961: 126).

Type: 31b (Pl. 23, *mm)* **No. of Specimens:** 11

Form: Stemmed form; small to medium triangular blades, square shoulders (approximately 90°), expanding stem, concave base; blade edge—straight to slightly convex; cross-section—plano-convex to lenticular; flaking—regular, medium; stem — expanding; base — concave.

Technique: Stems vary in width. Shaping of stem sometimes created shoulders of broad form, slightly greater than 90°.

Size Range: 2.45+-3.25+ x 1.85-2.4 x 0.4-0.6 cm.

Material: Obsidian (10), ignimbrite (1)

Distribution: Oe-141, Oe-171, Hu-17 (2), Hu-19, Hu-21 (4), Hu-39 (2)

Comparable Types: Lovelock Cave, Nevada, Type II: Grosscup 1960, Fig. 5, middle row, 13-4895

Mono County, California, Type 9: Meighan 1955, Fig. 3, no. 34

Mono County, California, Type 10: Meighan 1955, Fig. 3, no. 38

Idaho point type 56: Swanson, Tuohy, and Bryan 1958: 19

Site 10-AA-15, Idaho: Tuohy and Swanson 1960: 21, Fig. 1, no. 4

Danger Cave, type W-10: Jennings 1957: 110, Fig. 81a

Stahl Site (Pinto) square-shoulder sub-type: Harrington 1957, Fig. 39, third row

Karlo Site, type 4b: Riddell 1960, Plate 2, A, 4b

Ruby Cave, Nevada: Baumhoff n.d., Type III, top row, second from left

Deer Creek Cave, Nevada, types 6 and 6a: Shutler and Shutler n.d.

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58a

Comment: This group compares favorably with Harrington's (1957: 50, Fig. 39, third row) "Square-shouldered" sub-type of Pinto point. Again the pipeline collection contains point forms which differ slightly from Harrington's "square-shouldered" group.

Type: 32 (Pl. 23, *nn)* **No. of Specimens:** 2

Form: Stemmed form; triangular blade with symmetrical barbs, stem expanding, base missing; blade edge—straight; cross-section—lenticular; barbs set at less than 90° angle; flaking—regular, narrow to broad; stem—expanding; base—missing.

Technique: The smaller specimen exhibits narrow flaking scars; the larger exhibits broad shallow scars.

Size Range: 2.1-2.6+ x 1.9-2.6 x 0.4-0.5 cm.

Material: Obsidian

Distribution: El-58, Elk-38

Comparable Types: None

Comment: Probably a type of basally-notched point with the base missing.

Type: 32a (Pl. 24, *a)* **No. of Specimens:** 3

Form: Stemmed form; basally-notched point type with recurved blade edge, convex base; blade edge — recurved; cross-section — lenticular; basal barbs; flaking—regular, medium to broad; stem — expanding; base — convex (1 specimen only).

Technique: These basally-notched points have a distinctive recurved blade shaped like an ace of spades. The blade is symmetrical and the points are well made.

Size Range: 2.8-3.0+ x 1.9-2.5 x 0.4-0.55 cm.

Material: Obsidian

Distribution: El-60, Oe-170, Hu-19

Comparable Types: Wagon Jack Shelter, Nevada; Eastgate Expanding-Stem: Heizer and Baumhoff 1961: 124, Fig. 2, m

El Portal, California: Fitzwater and Van Vlissingen 1960, Fig II, No. 33

Tommy Tucker Cave, Lassen County, California: Fenenga and Riddell 1949: 211, Fig. 58, m

Kramer Cave, Falcon Hill, Nevada: Shutler, Rozaire and Shutler n.d.

Type: 32b (Pl. 24, *b)* **No. of Specimens:** 7

Form: Stemmed form; basally-notched point type with asymmetrical blade having one barb set at less than a 90° angle; blade edge—asymmetrical, concave, recurved, straight; cross-section — lenticular and plano-convex; flaking—regular, narrow to broad; stem—ex-

panding—varies from straight to convex or concave.

Technique: This group of basally-notched points exhibits one common feature, a blade edge with one barb.

Size Range: 1.7-4.15 x 1.0-2.55 x 0.25-0.7 cm.

Material: Obsidian (5), ignimbrite (2)

Distribution: Oe-145, Oe-169, Hu-17, Hu-21 (2), Hu-25

Comparable Types: None

Comment: Not broken specimens, but actually specimens made with only one barb.

Type: 33 (Pl. 24, *c)* **No. of Specimens**: 2

Form: Stemmed form; small triangular blade, wide barbs, rounded base; blade edge—straight; cross-section — lenticular; barbs set at about a 90° angle, wider than blade; flaking—regular, narrow to broad; stem—rounded.

Technique: The blade edge together with the barb form a concave edge. Over-all flaking on both faces. Basal thinning evident.

Size Range: 2.4-2.3+ x 2.1-2.2 x 0.5-0.55 cm.

Material: Obsidian, ignimbrite

Distribution: Oe-149, Oe-169

Comparable Types: None

Type: 34 (Pl. 24, *d)* **No. of Specimens**: 8

Form: Stemmed form; small to medium triangular blade, square-ended barbs; blade edge straight to slightly concave; cross-section — lenticular; barbs formed by basal notches at corners—at an acute angle; flaking—regular, narrow to broad; base—straight to convex.

Technique: These points were made on flakes. They were trimmed so that the barbs have squared-off ends. A well controlled technique.

Size Range: 1.6-3.05 x 1.4-2.1 x 0.25-0.45 cm.

Material: Obsidian (4), chalcedony (2), chrysoprase (?) (1)

Distribution: El-62, Oe-149, Oe-156, Elk-32, Hu-17, Hu-18, Hu-19, Pe-77

Comparable Types: Idaho point type 52: Swanson, Tuohy, and Bryan 1959: 18

Wilson Butte Cave point type 12a, Assemblages V and VI: Gruhn 1961a, Plate 14, U, V

Pence-Duerig Cave, Idaho, type 10b: Gruhn 1961b: 3, Fig. 2, L

Wagon Jack Shelter, Nevada: Eastgate Expanding-Stem: Heizer and Baumhoff 1961: 124, Fig. 2, q

Kawumkan Springs: Type 1b: Cressman 1956, Fig. 45

Type 6, Mono County, California: Meighan 1955, Plate 3, no. 20

Ruby Cave, Nevada: Baumhoff n.d., Fig. 1a, Type 1a

Deer Creek Cave, Nevada, Type 2: Shutler and Shutler n.d.

Hidden Cave, Nevada: Grosscup 1956: 58

Humboldt Cave, Nevada: Heizer and Krieger 1956, Plate 14 f

Comment: The larger square-tanged variant of this sub-group is not illustrated.

Type: 34a (Pl. 24, *e)* **No. of Specimens**: (1)

Form: Stemmed form, small triangular point with square-ended barbs, expanding stem, basal notch; blade edge — straight; cross-section — plano-convex; barbs formed by basal notches at corners; flaking—regular, narrow; base—notched.

Technique: Well controlled pressure flaking technique.

Size Range: 1.7+ x 1.3+ x 0.3 cm.

Material: Chalcedony

Distribution: Oe-171

Comparable Types: Wagon Jack Shelter, Nevada: Eastgate Split-stem: Heizer and Baumhoff 1961: 125, Fig. 3, i-m

Comment: This point was found on a butte-top associated with oval rock alignments; see type 26 also.

Type: 35 (Pl. 24, *f)* **No. of Specimens**: 5

Form: Stemmed form; small to medium points with short stems, basally-notched, concave bases; blade edge—straight to convex; cross-section — lenticular; barbs at an acute angle; flaking — regular, medium to broad; base—concave.

Technique: Moderately well controlled flaking technique.

Size Range: 2.35-4.2 x 1.7-2.7 x 0.3-0.7 cm.

Material: Chalcedony

Distribution: Elk-34, Elk-39, Hu-19, Hu-21 (2)

Comparable Types: Site A, Falcon Hill, Nevada: Shutler, Rozaire and Shutler n.d.

Hidden Cave, Nevada: Grosscup 1956: 58

Type: 35a (Pl. 24, *g)* **No. of Specimens**: 1

Form: Stemmed form; medium-sized, basally-notched point; blade edge — convex; cross-section—lenticular; barbs at an acute angle;

flaking—regular, medium; base—split stem, deeply concave; stem—expanding.

Technique: A well-made point.

Size Range: 2.0+ x 3.15 x 0.5 cm.

Material: Chalcedony

Distribution: Oe-170

Comparable Types: Wagon Jack Shelter, Nevada: Elko-Eared: Heizer and Baumhoff 1961: 126, Fig. 4, b

Type: 35b (Pl. 24, *h)* **No. of Specimens:** 15

Form: Stemmed form; small to medium basally-notched points; blade edge — straight to convex; cross-section—lenticular and plano-convex; barbs are all at an angle less than 90°; flaking—regular, narrow to broad; base—convex (on specimens with such an attribute).

Technique: Technique varies; some specimens exhibit small, narrow flaking scars, others have broad shallow scars.

Size Range: 1.9+ -3.7 x 1.3-2.0 x 0.25-0.6 cm.

Material: Obsidian (8), Ignimbrite (6), chalcedony (2)

Distribution: El-56, Oe-145 (2), Oe-147, Oe-165, Oe-169 (4), Oe-170, Elk-41, Hu-17 (2), Hu-39, Hu-43

Comparable Types: Wilson Butte Cave, Idaho, Type 11c, Assemblage V; Gruhn 1961a: 69, Plate 14, S

Pictograph Cave Type 6: Mulloy 1958, Fig. 6, nos. 19, 20, 22, 25, 26

Deer Creek Cave, Nevada, Type 8g; Shutler and Shutler n.d.

Comment: A catch-all category for indented base points showing very slight indentations.

Type: 35c (Pl. 24, *i)* **No. of Specimens:** 1

Form: Stemmed form; very small basally-notched, miniature point; blade edge—convex; cross-section—lenticular; barbs set at an angle of less than 90°; flaking regular, narrow; base—convex.

Technique: Made on a flake.

Size Range: 1.35 x 1.0 x 0.3 cm.

Material: Ignimbrite

Distribution: Oe-169

Comparable Types: None

Comment: See also type 1c and type 27 for points of comparable size.

Projectile Point Fragments

The 195 pieces of projectile points which were deemed too fragmentary for classification are tips, medial sections, and broken stems and bases. These all show bifacial scars. A total of 71 tips was recovered, 37 from sites in Idaho and 34 from Nevada. The medial sections total 85 in number, 42 from Idaho and 43 from Nevada. Twenty-five basal fragments were recovered from Idaho and 14 from Nevada, 39 in all.

As might be expected, the 104 specimens from Idaho and the 91 specimens from Nevada show the same variation in materials apparent from the study of waste flakes. Materials such as chalcedony, chert, and other fine-grained, light-colored minerals make up 38% of the Idaho fragments and 15% of the Nevada fragments.

Flake Points

This group of 24 specimens is a catch-all grouping for flakes retouched in such a manner that they resemble projectile points. Both stemmed and unstemmed forms are represented. All previously described projectile point types exhibit well controlled bifacial pressure flaking, whereas "flake points" lack this attribute.

Type: Flake points (Pl. 24, *w, x, y, z, aa, bb, cc, dd, ee, ff, gg, hh, ii, jj, kk)* **No. of Specimens:** 24

Form: This group is an odd lot of flakes retouched in such a manner that they resemble both stemmed and unstemmed types of projectile points.

Technique: There is no consistent chipping technique apparent, although all specimens are made on flakes.

Size Range: 1.5-4.0 x 1.0-3.6 x 0.15-1.8 cm.

Material: Obsidian (10), chalcedony (6), basalt (5), quartzite (1), rhyolite (1), ignimbrite (1)

Distribution: El-58 (2), Oe-145 (2), Oe-152, Oe-169 (2), Oe-170, Oe-171, Elk-26, Elk-27, Elk-39, Hu-17 (4), Hu-19 (3), Hu-39 (3), Hu-43, Pe-67

Comparable Types: Harrington 1957: 56-57, Fig. 41 bottom row center

Comment: Flake points, as Harrington (1957: 56-57) explains, are flakes that could have been used as emergency projectile points.

Knives

A total of 191 specimens were classified as

knives. These were segregated into six groups and several sub-groups. As in the case of projectile points, gross morphological features determined the groupings. While some knife types are rather well made, others probably are "blanks" or incompletely flaked or incompletely reduced specimens. Knife type 2a, represented by 82 specimens, is an example of such an unfinished type of knife. Some specimens called knives might have served as scrapers or as other types of cutting tools.

At pipeline sites in Idaho, chalcedony, chert, and basalt were favored materials for knives, while obsidian was the preferred material at pipeline sites in Nevada. The distribution study of comparable knife types is not complete, but the few reports examined do show that comparable knife types are found in the northern Great Basin.

Knife Type: 1 (Pl. 25, *a)* **No. of Specimens**: 2

Form: Unstemmed; small to medium triangular outline, slightly excurvate blade edge; recurved base; blade edge — convex; cross-section — lenticular; flaking — regular, broad; base—recurved.

Technique: Rather broad shallow flakes were removed from both faces of these knives.

Size Range: 3.65-5.75 x 2.6-3.0 x 0.6-0.7 cm.

Material: Chalcedony, quartz-bearing metamorphic rock.

Distribution: El-56, Oe-140

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 132, Fig. 6, f

Comment: Very well-made specimens.

Knife Type: 2 (Pl. 25, *b)* **No. of Specimens**: 21

Form: Unstemmed; small to medium well-made knives with convex base and convex to straight blade edge; blade edge — convex to straight; cross-section — lenticular; flaking — regular, medium to broad; base—convex.

Technique: A distinguishing feature of these knives and one which separates them from other ovate knife types is the presence of well executed flaking scars. Another distinguishing feature is their relatively thin cross-section.

Size Range: No complete specimens: 2.5+-3.65+ x 1.9-2.8 x 0.4-0.65 cm.

Material: Obsidian (11), ignimbrite (2), chalcedony (6), chert (1), fine-grained metamorphic rock with much quartz (1)

Distribution: Oe-145, Oe-170, Oe-171, Oe-172, El-31, N-285, Hu-17 (3), Hu-21 (3), Hu-35, Hu-39 (5), Hu-43, Pe-67, Pe-71

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 132, Fig. 6, b, c

Idaho point type 35: Swanson, Tuohy, and Bryan 1959: 75, no. 35

Wilson Butte Cave, knife Type 2b: Gruhn 1961a: 74, Plate 15, D

Pictograph Cave blade type 2: Mulloy 1958, Fig. 7, nos. 10, 19

Danger Cave Type W-44: Jennings 1957: 134

Comment: Well-made rather thin knives or large points.

Knife Type: 2a (Pl. 25, *c)* **No. of Specimens**: 82

Form: Unstemmed; fragments of large, relatively well-made, ovate knives with convex bases.

Technique: Workmanship varies; some specimens show narrow to medium flake scars, others exhibit broad but regular flaking scars.

Size Range: No complete specimens. Knives would probably average about 7 cm. long and 3.5-4.0 cm. wide.

Material: Obsidian (32), banded obsidian (1), basalt (7), chert (5), limestone (1), chalcedony (27), quartz (2), opal (3), others (4). Obsidian was not used to make these knives north of the Elko-Humboldt County line in Nevada, an area coinciding with the linguistic boundary between the Western Shoshoni and Northern Paiute.

Distribution: El-56 (2), Oe-141 (2), Oe-145 (6), Oe-156 (2), Oe-167 (2), Oe-168 (3), Oe-169, Oe-170 (5), Oe-171 (7), Elk-27 (2), Elk-29 (4), Elk-39 (2), Hu-17 (6), Hu-18 (2), Hu-19 (3), Hu-21 (11), Hu-26, Hu-30 (2), Hu-37 (2), Hu-39 (10), Hu-43, Hu-44, Pe-67 (3), Pe-70, Pe-80

Comparable Types: Idaho point types 37A, 37B: Swanson, Tuohy, and Bryan 1959: 76

Wilson Butte Cave, Types 1, 2a: Gruhn 1961a: 73-74, Plate 15, A, B, C

Comment: A catch-all category for large relatively well-made ovate knife fragments. South of the Humboldt-Elko County line obsidian was the predominent material used for this type of knife; north of that boundary obsidian was not used to make the specimens found along the pipeline.

Knife Type: 2b (P. 25, *d)* **No. of Specimens**: 8

Form: Unstemmed; small to medium-sized ovate knives or scrapers with a definite keel on one face.

Technique: All exhibit rather broad flaking scars and one or more retouched edges.

Size Range: 2.3-6.9 x 1.75-3.6 x 0.85-1.3 cm.

Material: Obsidian (5), chalcedony (2), basalt (1)

Distribution: Oe-169, Oe-171 (2), Hu-17, Hu-21, Hu-33 (2), Pe-80

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 132, Fig. 6, d

Knife Type: 3 (Pl. 25, *e)* **No. of Specimens**: 28

Form: Unstemmed; small to medium-sized ovate knives or scrapers with convex bases; chipping technique was not as well controlled on these specimens as on preceding knife types. These possibly represent unfinished specimens.

Technique: All specimens exhibit rather broad flaking scars.

Size Range: 3.1-5.15 x 2.2-3.25 x 0.6-1.15 cm.

Material: Obsidian (19), chalcedony (6), basalt (1). The distribution of this type is interesting; only one knife from Idaho (Oe-171) is made of obsidian. Likewise, only one knife of this type from Nevada is made of chalcedony (Hu-39).

Distribution: Oe-138, Oe-145, Oe-170 Oe-171 (5), Hu-17 (5), Hu-19 (2), Hu-21 (2), N-2346, Hu-27, Hu-35, Hu-39 (4), Hu-43 (2), Pe-67, Pe-79

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 132, Fig. 6, g

Comment: Like type 2a knives, this group shows a distribution pattern of preferred materials; in Idaho, chalcedony, cherts, jaspers, basalt, and other materials were used to make this type of knife, while in Nevada, obsidian was the preferred material.

Knife Type: 3a (Pl. 25, *f)* **No. of Specimens**: 24

Form: Unstemmed; small to medium-sized elongated ovate knives or scrapers with convex bases.

Technique: Edges of all specimens reduced by the removal of rather broad flakes. This group of specimens is relatively long and narrow when compared to type 3 knives.

Size Range: 3.1+-5.3+ x 1.7-2.2 x 0.7-1.7 cm.

Material: Obsidian (11), rhyolite (2), siltstone (1), basalt (1), chalcedony (2)

Distribution: El-56 (2), Oe-145 (2), Oe-170, Oe-171, Hu-17 (4), Hu-21, Hu-33, Hu-37, Hu-39 (3), Pe-67

Comparable Types: Idaho point type 30: Swanson, Tuohy, and Bryan 1959: 75, no. 30

Comment: The width of these specimens ranges from 1.7-2.2 cm., while that of type 3 knives ranges from 2.2-3.25 cm.

Knife Type: 4(Pl. 25, *g)* **No. of Specimens**: 10

Form: Unstemmed; small to large ovate knives with concave bases. This is the general form.

Technique: Bifacially flaked implements with one feature in common—thinned concave bases.

Size Range: 2.9+-6.0 x 2.5-4.15 x 0.55-1.4 cm.

Material: Obsidian (8), chalcedony (2)

Distribution: Oe-145, Hú-17 (2), Hu-19, Hu-21 (4), Hu-33, Pe-80

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 132, Fig. 6, d

Comment: These might have served as scrapers as well as knives.

Knife Type: 4a (Pl. 25 *h)* **No. of Specimens**: 1

Form: Unstemmed; basal fragment of a lanceolate knife or point with convex edges and a slightly concave base.

Technique: Moderately well controlled pressure or percussion flaking; the specimen exhibits regular broad flaking scars.

Size Range: 3.15+ x 2.9 x 0.75 cm.

Material: Obsidian

Distribution: Hu-39

Comparable Types: Idaho point type 41: Swanson, Tuohy, and Bryan 1959: 76, no. 41

Comment: This specimen resembles pipeline point type 4h, represented by one specimen. It is possible that this specimen is also a scraper.

Knife Type: 5 (Pl. 25, *i)* **No. of Specimens**: 2

Form: Stemmed form; blade edges taper to a blunt point; shoulder — rounded; base — straight.

Technique: Made from a large flake with the striking platform serving as a base. Broad collateral flaking technique.

Size Range: 6.6 x 2.25 x 0.7 cm.
Material: Chert; chalcedony
Distribution: Oe-145, 0e-171
Comparable Types: None
Comment: A very well-made knife

Knife Type: 5a (Pl. 25, *j*) **No. of Specimens**: 11

Form: Stemmed form; these small to medium sized knives all have, or appear to have, basal protuberances, although blade shape varies.
Technique: All exhibit bifacial percussion or pressure flaking. Flaking scars are medium to broad.
Size Range: 3.0-4.3 x 2.4-3.2 x 1.25-1.4 cm.
Material: Obsidian
Distribution: Hu-17 (3), Hu-18 (2), Hu-19, Hu-21, Hu-35, Hu-39 (2), Hu-43
Comparable Types: Idaho point type 43: Swanson, Tuohy, and Bryan 1959: 76, no. 43
Comment: Note the rather restricted distribution along the pipeline. Not one knife of this type was found outside of Humboldt County, Nevada.

Knife Type: 6 (Pl. 24, *j, k*) **No. of Specimens**: 2

Form: Small asymmetrical knives, made on flakes.
Technique: Made on flakes; plano-convex cross-section; flakes were retouched around edges.
Size Range: 2.3-3.0 x 1.4-1.9 x 0.35-0.5 cm.
Material: Obsidian
Distribution: Oe-141, Oe-157
Comparable Types: Wilson Butte Cave, Idaho, Knife Type 6: Unplaced: Gruhn 1961a: 76, Plate 15, j
Comment: These little knives are rather well-made specimens which may have diagnostic value.

Scrapers

The 423 specimens classified as scrapers were placed into twelve descriptive groupings. Two groups, utilized thin flakes and bifacial side-and-end scrapers, contain roughly 70% of the total number of scraping tools recovered. Scraper planes were relatively scarce, only three specimens being so classified. Other scraper types are described in the following pages. Comparable types of scrapers have been found in the northern Great Basin, and there is a multiplicity of types reported in the literature. No complete examination of all the reports was undertaken, but a few comparable types are cited in the following descriptions. Economy in research here seems justified, as scraper types with surface provenience have little diagnostic value. However, the masses of information which have accumulated concerning scraping tools might profitably be re-examined. Experimental studies with scraping tools might also yield valuable results.

Scraper Type: 1 (Pl. 26, *a, b*) **No. of Specimens**: 10

Form: Snub-nosed end scraper, made on a plano-convex flake; ovoid outline; steep flaking on convex bit.
Technique: Made on a plano-convex flake; some retouching scars are also present on planar face.
Size Range: 1.95-2.80 x 2.0-3.1 x 0.4-0.6 cm.
Material: Chalcedony (6), obsidian (2), chert (1), other (1)
Distribution: El-58, Oe-143, Oe-156, Oe-170, Oe-172, Elk-27 (2), Hu-17, Hu-39, Pe-67
Comparable Types: Wilson Butte Cave, Idaho, scraper type 1: Gruhn 1961a: 78, Plate 16, A, B, C
Idaho scraper type 26 (?): Swanson, Tuohy, and Bryan 1959: 37

Scraper Type: 2 (Pl. 26, *c, d*) **No. of Specimens**: 11

Form: Large, flake end scrapers; uniface; convex bit; ovate outline.
Technique: These were made on ovate flakes, generally plano-convex in cross-section; retouching is often present on both faces of bit.
Size Range: 3.0-6.7 x 3.5-6.8 x 0.9-1.25 cm.
Material: Chalcedony (8), obsidian (2), chert (1)
Distribution: Oe-149, Oe-172 (2), Elk-29, Elk-37, Elk-40, Hu-17, Hu-19, Hu-39 (3)
Comparable Types: Wilson Butte Cave, Idaho, scraper type 2: Gruhn 1961a: 79, Plate 16, D, E

Scraper Type: 3 (Pl. 26, *e, f*) **No. of Specimens**: 9

Form: Steep flake scrapers; characterized by steep flaking on sides or end; plano-convex cross-section.

Technique: Thick flakes were chosen for this type. They are stout flakes which exhibit steep flaking scars on one or more edges. Made on plano-convex flakes.

Size Range: 1.5-4.2 x 1.5-2.1 x 0.7-1.2 cm.

Material: Chalcedony (7), chert (1), other (1)

Distribution: Oe-145 (2), Oe-151, Oe-152, Oe-167, Oe-169, Oe-171, Hu-18, Hu-21

Comparable Types: Wilson Butte Cave, scraper type 3: Gruhn 1961a: 79, Plate 15, F, G

Scraper Type: 4 (Pl. 26, *g, h)* **No. of Specimens**: 13

Form: Pointed flake scrapers; side scrapers made from keeled, pointed flakes; plano-convex cross-section.

Technique: This type of scraper was made on a keeled plano-convex flake. Edges of points may be retouched on one or both sides.

Size Range: 2.4-5.1 x 1.8-2.1 x 0.35-0.65 cm.

Material: Chalcedony (9), obsidian (4)

Distribution: Oe-145, Oe-148, Oe-156 (3), Oe-164, Oe-167, Oe-171, Hu-19 (5)

Comment: These might also have functioned as knives.

Scraper Type: 5 (Pl. 26, *i, j)* **No. of Specimens**: 29

Form: Thin flake side scrapers; made on thin, flat, flakes; bits may be straight or convex.

Technique: Thin, flat flakes were chosen for this type of scraping tool. Made on plano-convex flakes.

Size Range: 1.5-4.2 x 1.5-4.7 x 0.45-1.15 cm.

Material: Chalcedony (19), obsidian (7), chert (2), basalt (1)

Distribution: El-56, Oe-145 (6), Oe-148, Oe-150, Oe-151 (2), Oe-156 (3), Oe-162, Oe-167, Oe-171, Elk-27, Elk-29 (2), Hu-19, Hu-21 (2), Hu-31, Hu-33, Pe-67, Pe-71, Pe-77, Pe-80

Comparable Types: A widespread scraper type.

Scraper Type: 6 (Pl. 26, *k, l)* **No. of Specimens**: 18

Form: Thin flake, concave-edged side scrapers; cross-section—plano-convex.

Technique: With one exception, a specimen from Oe-167, these are all small flakes which have one or more concave edges.

Size Range: 2.0-6.4 x 1.2-5.3 x 0.3-1.1 cm.

Material: Obsidian (12), ignimbrite (4), chalcedony (2)

Distribution: El-56, Oe-142, Oe-145 (3), Oe-151, Oe-162, Oe-167, Oe-172, Hu-18 (2), Hu-19 (4), Hu-21, Hu-31, Hu-42

Comparable Types: A widespread type of scraper.

Scraper Type: 7 (Pl. 26, *m, n)* **No. of Specimens**: 153

Form: Utilized thin flakes; plano-convex cross-section, worked on utilized edges.

Technique: Thin waste flakes which show use-flaked edges.

Size Range: 2.0-4.6 x 1.1-3.7 x 0.3-1.2 cm.

Material: Obsidian (71), chalcedony (68), basalt (5), ignimbrite (4), other (5)

Distribution: El-56 (3), Oe-138, Oe-139, Oe-141 (5), Oe-142 (3), Oe-145 (18), Oe-149 (2), Oe-151 (6), Oe-152, Oe-155, Oe-156 (3), Oe-157, Oe-160, Oe-162, Oe-164 (3), Oe-165, Oe-166, Oe-167 (6), Oe-168, Oe-169, Oe-170 (13), Oe-171 (4), Oe-172, Elk-26 (2), Elk-29, Elk-32, Elk-39 (5), Hu-17 (7), Hu-18 (8), Hu-19 (31), Hu-21 (11), Hu-38, Hu-39 (2), Hu-43, Pe-67, Pe-72, Pe-80, N-2-5393

Comparable Types: A widespread scraper type.

Scraper Type: 8 (Pl. 26, *o, p)* **No. of Specimen**: 30

Form: Large plano-convex side scrapers; straight or convex working edge.

Technique: Relatively large flakes were chosen for this type of scraper; made on a plano-convex flake.

Size Range: 2.3-7.1 x 1.8-3.5+ x 1.0-2.4 cm.

Material: Obsidian (10), chalcedony (10), basalt (8), other (2)

Distribution: El-58, Oe-145 (2), Oe-151, Oe-155, Oe-157, Oe-158, Oe-170, Oe-171 (3), Oe-172 (2), Elk-27, Elk-40, Hu-18, Hu-19 (6), Hu-21 (4), Hu-33, Hu-35, Hu-39, Pe-80

Scraper Type: 9 (Pl. 26, *q, r)* **No. of Specimens**: 143

Form: Bifacial side and end scrapers; retouching applied on both faces of working edge.

Technique: These scrapers vary in size, and in general one or both faces show over-all chipping scars.

Size Range: 1.3-4.0 x 1.1-5.1 x 0.35-2.1 cm.

Material: Chalcedony (63), obsidian (51), basalt (12), ignimbrite (6), other (11)

Distribution: El-56 (2), El-58 (2), Oe-140, Oe-141 (4), Oe-143, Oe-145 (23), Oe-148, Oe-149 (4), Oe-151 (5), Oe-154, Oe-156 (5), Oe-157 (2), Oe-160, Oe-162 (3), Oe-163, Oe-164, Oe-166, Oe-167 (3), Oe-169 (2), Oe-170 (12), Oe-171 (5), Oe-172 (4), Elk-26, Elk-27 (3), Elk-29 (2), Elk-32, Elk-38, Elk-39 (2), Elk-40 (3), Hu-17 (11), Hu-18 (12), Hu-21 (7), Hu-30, Hu-39 (5), Pe-67 (4), Pe-70 (2), Pe-75, Pe-80 (3)

Scraper Type: 10 (Pl. 26, *s)* **No. of Specimens**: 4

Form: Pebble flake scrapers; plano-convex cross-section.

Technique: Made on large, thick flakes; high-angle flakes removed from one or more edges.

Size Range: 6.9-7.9 x 3.3-5.1 x 2.3-2.4 cm.

Material: Basalt (2), chert (1)

Distribution: Hu-21, Hu-33, Hu-39

Comparable Types: Wilson Butte Cave, scraper type 8: Gruhn 1961a: 81, Plate 16, O

Scraper Type: 11 (Pl. 26, *t)* **No. of Specimens**: 3

Form: Ovate scraper planes; plano-convex cross-section.

Technique: Made on large, thick flakes; high-angle flakes removed from one or more edges.

Size Range: 6.9-7.9 x 3.3-5.1 x 2.3-2.4 cm.

Material: Basalt (2), chert (1)

Distribution: Hu-21, Hu-33, Hu-39

Comparable Types: Wilson Butte Cave, scraper type 8: Gruhn 1961a: 81, Plate 16, O

Scraper Type: 12 (Pl. 24, *k)* **No. of Specimens**: 2

Form: Large thin flakes with one retouched edge; possibly knives or saws.

Technique: Large thin flakes lacking overall chipping scars were chosen for these scrapers, knives or saws.

Size Range: 14.5-14.7 x 3.7-7.9 x 1.0-1.2 cm.

Material: Micaceous schist (1), rhyolite (1)

Distribution: Pe-67, Pe-79

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 132, Fig. 6, a

Comment: These two specimens were probably used as saws or knives rather than as scrapers.

Choppers

Choppers or chopping tools were not strongly represented in the survey collection. Only 11 specimens were found. These were divided into four descriptive groupings. Flake choppers with a bifacially flaked working edge comprise the most numerous group recovered. Core choppers, pebble choppers, and a single prismatic core chopper make up the balance of tools in this category.

Chopper Type: 1 (Pl. 27, *a)* **No. of Specimens**: 1

Form: Core chopper; bifacially flaked, battered edges.

Technique: Large flakes removed from both edges of convex bit.

Size Range: 10.3 x 7.7 x 4.1 cm.

Material: Basalt

Distribution: Pe-72

Chopper Type: 2 (Pl. 27, *b)* **No. of Specimens**: 7

Form: Large flake choppers or flake cores; bifacially flaked.

Technique: Large flakes exhibiting jagged edges formed by the removal of broad wide flakes from both faces.

Size Range: 5.8-9.0 x 5.3-8.2 x 1.6-3.2 cm.

Material: Basalt (5), other (2)

Distribution: Oe-166, Hu-39 (3), Hu-42, Pe-67, Pe-79

Chopper Type: 3 (Pl. 27, *c)* **No. of Specimens**: 1

Form: Prismatic core chopper; well-made specimen; semi-lunar outline.

Technique: Well controlled over-all flaking on both faces.

Size Range: 11.3 x 6.5 x 2.8 cm.

Material: Chert

Distribution: El-29

Comment: This specimen may be a well prepared core, rather than a core tool.

Chopper Type: 4 (Pl. 27, *d)* **No. of Specimens**: 2

Form: Pebble chopper; part of pebble cortex intact.

Technique: Made by removal of percussion flakes from both sides of a fist-sized pebble.

Size Range: 9.8-10.4 x 5.7-6.3 x 4.8-4.9 cm.

Material: Chert, basalt

Distribution: El-56, Hu-39

Comment: One is shaped more like a pick, and the second has a battered end.

Gravers

Graving tools are represented in the survey collection by 23 specimens. There are two types, those showing overall flaking scars on both faces, and those made on plano-convex flakes. The distribution of gravers is such that these typological distinctions seem to have little significance.

Graver Type: 1 (Pl. 24, *l, m)* **No. of Specimens**: 14

Form: Plano-convex gravers; made on a flake.

Technique: Flat flakes with natural protuberances were chosen for these tools. Planar face is not retouched except occasionally around an edge.

Size Range: 1.9-4.3 x 1.8-2.7 x 0.7-0.8 cm.

Material: Obsidian (8), chalcedony (5), other (1)

Distribution: El-56, Oe-145 (2), Oe-167, Oe-170, Oe-171, Oe-172, Elk-26, Hu-19 (3), Pe-73, Pe-80 (2)

Graver Type: 2 (p. 24, *n, o)* **No. of Specimens**: 9

Form: Bifacially chipped gravers; lenticular cross-section.

Technique: These gravers show over-all bifacial flaking on both faces.

Size Range: 1.3-4.5 x 1.1-2.65 x 0.5-1.0 cm.

Material: Obsidian (8), chalcedony (1)

Distribution: Oe-142, Oe-151, Elk-32, Elk-38, Hu-17 (2), Hu-18, Hu-21, Hu-39

Drills

Drills comprise another small minority of chipped stone tools recovered by the survey. A total of 18 specimens was recovered, all but one from Idaho sites. Drills were sorted into four descriptive groupings. A heavy duty drill with a stout bit and a rectangular base is represented by 13 specimens. The three other drill types are represented by only five specimens.

Drill Type: 1 (Pl. 24, *p, q, r)* **No. of Specimens**: 13

Form: Rectangular base, tapered bit; working end or drill end has diamond-shaped cross-section.

Technique: These appear to be heavy duty drills with strong bits.

Size Range: 2.8+-3.4 x 1.2-2.0 x 0.4-0.6 cm.

Material: Chalcedony (8), ignimbrite (1), basalt (1), siltstone (1)

Distribution: El-56, Oe-149, 0e-151 (2), Oe-156, Oe-167, Oe-170, Oe-171 (4), Hu-21

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 127, Fig. 5, o

Drill Type: 2 (Pl. 24, *s, t)* **No. of Specimens**: 3

Form: Flake drills, flared base; plano-convex base.

Technique: These three drills are small flakes retouched on both sides of the bit. They appear to be a small, light type of drill.

Size Range: 1.9-2.5 x 1.3-1.7 x 0.2-0.35 cm.

Material: Ignimbrite (1), obsidian (1), chalcedony (1)

Distribution: Oe-145

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 127, Fig. 5 r

Drill Type: 3 (Pl. 24, *u)* **No. of Specimens**: 1

Form: Triangular, concave sides and base; cross-section of bit is diamond-shaped. Heavy-duty type.

Technique: Well controlled attempt at collateral flaking produced flaking scars.

Size Range: 3.2 x 2.6 x 0.7 cm.

Material: Chalcedony

Distribution: Oe-151

Drill Type: 4 (Pl. 24, *v)* **No. of Specimens**: 1

Form: Tapered, narrow, lanceolate drill; base —missing; lenticular cross-section.

Technique: A long, narrow drill made on a flake.

Size Range: 2.75 x 0.75 x 0.35 cm.

Material: Chalcedony

Distribution: Oe-145

Comparable Types: Wagon Jack Shelter, Nevada: Heizer and Baumhoff 1961: 127, Fig. 5, p

Miscellaneous Chipped Stones

Cores. Four large cores and ten smaller ones were collected at sites along the pipeline. The large cores range from 8.2 cm. to 13.4 cm. in diameter. Two are composed of quartzite with most of the cortex of the original pebble intact.

The third is basalt, and the other is chalcedony. These cores were found at El-57, El-58, Oe-156, and Oe-166 respectively.

The smaller cores range in size from 3.5 cm. to 6.4 cm. in diameter. Four are composed of obsidian, two of chert, two of basalt, one of ignimbrite, and one of chalcedony. They were recovered at Oe-140, Hu-18, Hu-19 (2), Oe-145 (2), El-56, Hu-39, Oe-168, and Oe-170 respectiveley. All the cores show bifacial flaking scars and one obsidian specimen from Hu-19 has a prepared platform at one end.

Large Flakes. Very large flakes, not previously mentioned, were occasionally found at pipeline sites. They range in length from 6.0 cm. to 13.8 cm. While some might have served as large flake tools, no retouching along the edges is apparent. The distribution of these large flakes and the materials represented are as follows: El-56, quartzite; El-57, siltstone; Oe-145, quartzite and basalt; Hu-25, chalcedony, rhyolite, and obsidian; Hu-26, chalcedony; Hu-39, chalcedony; Pe-67, chert.

GROUND AND PECKED STONE ARTIFACTS

Less than 5% of the stone artifacts are ground or pecked stone tools. Metates and hand stones or manos, mortars and pestles, shaft smoothers, a tubular stone pipe, and miscellaneous anvil stones, hammer stones, rubbing stones, edge-battered cobbles and the like, make up this class of stone artifacts.

Metates

Metates and manos or hand stones are companion tools used in grinding wild seeds and other plant parts. Two types of metates were collected or were noted at pipeline sites. Actually both are sub-types of slab metates. One sub-type has trimmed or shaped edges, while the other lacks this modification. (Pl. 30, *a*, *b*).

Eight shaped slab metates or fragments of this sub-type of nether stone were collected. The complete specimens range in size from an oval-shaped stone 30 cm. long, 22.6 cm. wide, and 4.1 cm. thick, to a metate 52.6 cm. long, 37.8 cm. wide, and 2.7 cm. thick. The grinding surfaces or worn areas are also oval-shaped, and they are restricted to one face of the slab.

Five unshaped slab metates were collected. These are similar in all respects to the shaped specimens except that they lack dressed edges.

Materials chosen for metates were medium to coarse textured rocks, such as granite, basalt scoria, vesicular basalt and rhyolite. When worn by abrasion, the rocks tend to crumble, and fresh, jagged grinding surfaces are created. Sometimes, however, such a face was deliberately pecked to create a fresh grinding surface.

Shaped and unshaped slab metates were collected from the following sites: El-58, Oe-139, Oe-140, Oe-145 (2), Oe-162 (2), Hu-39, Pe-67 (2), Pe-77, and Pe-79 (2).

Manos

Manos or hand stones from pipeline sites are all fist-sized stones exhibiting flat to convex faces shaped by contact with metates during the grinding of foodstuffs.

Twenty-one typable manos were recovered. Ten exhibit grinding wear on only one face; the remainder exhibit bifacial grinding wear. The manos are all less than 14 cm. in length, and 10 cm. in width. Thickness varies from 3.4 cm to 7.7 cm.

Manos can be separated into sub-types based upon overall shape, and configuration of working surfaces. The three sub-types are oval, sub-rectangular, and tabular, and each sub-type contains unifacially and bifacially ground specimens (Pl. 31, *a*, *b*, *c*, *d*, *e*, *f*). Oval manos are simply oval-shaped stones with flat to strongly convex grinding surfaces. Ten specimens were so classified. Sub-rectangular manos have squared-off ends and flat to convex grinding surfaces. Seven manos fall into this category. Tabular manos are oval-shaped stones with relatively flat grinding surfaces. There are four specimens in the collection.

Like materials chosen for metates, those used for hand stones were medium to coarse textured rocks. Vesicular basalt, basalt scoria, granite, schist and sandstone were preferred.

Oval manos were found at the following sites: Oe-162, Oe-167 (3), Pe-67, Pe-79 (3), Pe-80 (2). Sub-rectangular manos came from sites El-58, Oe-145 (2), Oe-162 (2), Hu-39, and Pe-67. Tabular manos were recovered at Pe-67 (2), Pe-68, and Pe-79.

Mortars

Like metates and manos, mortars and pestles are food preparation tools whose shapes are

largely determined by their uses. While the working surfaces of the milling stones are shaped primarily by grinding, mortars and pestles take their shape from the pecking and pounding wear to which they are subjected.

In addition to the previously described bedrock mortars at sites Oe-145 and Oe-167, five portable mortars were recovered by the survey. Two types, one with a deep basin and one with a very shallow basin, may be distinguished (Pl. 30, *c*). All the pipeline examples are made of basalt or vesicular basalt. Basins of both types are all less than 15 cm. in diameter, and they vary in depth from 0.5 cm. to more than 7.0 cm. Shallow basin mortars, possibly hopper mortars, were recovered at sites El-56, El-62, and Oe-172. Deep basin mortars were found at El-58 and Elk-35.

Pestles

Five pestles, all fragmentary specimens, were collected. Two types seem to be represented: a tapered cylindrical type of shaped pestle, and an unshaped oval rectangular type (Pl. 29, *a*, *b*, *c*, *d*). The three shaped pestles range between 5.0 and 7.0 cm. in diameter. One unshaped pestle is 3.7 cm. in diameter. The other is of comparable size. Shaped pestles, all basalt, were recovered at El-56, Oe-165, and Hu-39. Unshaped pestles were found at Oe-145 and Oe-171.

Shaft Smoothers

Three shaped and grooved sandstone shaft smoothers or shaft abraders were found (Pl. 28, *a*, *b*, *c*). Two types are represented. Two specimens have rounded or "boat-shaped" ends, and the third has squared-off ends. The rectangular specimen has one groove 1.1 cm. wide and 0.3 cm. deep on one face of the tool. The top face of one boat-shaped specimen contains a single groove 0.8 cm. wide and 0.3 cm deep. The bottom face exhibits saw marks which do not meet. Evidently the tool was sawed from both sides and then broken from the parent rock. The second boat-shaped tool contains two grooves. The groove on top is 1.5 cm. wide and 0.4 cm. deep. The second groove, placed on the side of the abrader, is 0.17 cm. wide and 0.2 cm. deep. The bottom of this tool is rounded. The rectangular smoother and one boat-shaped smoother were recovered at Oe-145 in Idaho, while the boat-shaped abrader with two grooves was found at Pe-67 in Nevada.

Tubular Stone Pipe

A single tubular stone pipe was recovered along the pipeline route (Pl. 28, *d*). It came from site Pe-68 in Pershing County, Nevada. The pipe is a fragment 3.7 cm long, and 2.1 cm. in diameter. A soft, light material, possibly soapstone, was chosen to make the pipe. The specimen was biconically drilled, and the diameter of the bowl end is 1.4 cm while the hole leading from the stem to the bowl is only 0.3 cm. in diameter. The pipe's exterior is deeply pitted and gives one the impression that thermal fracturing created the pits.

Miscellaneous Ground and Peck Stones

Included in this group are an anvil stone, two edge-battered cobbles, an elongated pebble hammer stone, a rubbing stone, and five polishing stones.

Edge-battered Cobbles. Two specimens were classified as edge-battered cobbles. Both specimens are quartzite pebbles. The whole specimen, from Oe-167, has three edges opposite the butt end which are battered and worn smooth by pecking and grinding wear (Pl. 28, *h*). This ovate pebble is 8.4 cm. long, 13.4 cm. wide, and 3.3 cm thick. The fragmentary specimen is the bit end of a similar tool. It was recovered at El-56.

Elongated Pebble Hammer. One elongated oval-shaped pebble, used as a hammer stone, shows a different wear pattern than that previously described for hammer stones. Wear is confined to both ends of the tool and to small areas adjacent to the ends (Pl. 28, *i*). This stone is 12.7 cm. long, 4.7 cm. wide, and 3.2 cm. thick. It was found at El-62.

Polishing Stones. Six small pebbles, one a rounded quartz crystal, are included in this grouping. These stones exhibit polished faces or worn edges, apparently from use as abraders or polishers of some sort (Pl. 28, *f*, *g*). The largest is 5.2 cm. in diameter and 2.8 thick. The others are of comparable size, which would indicate that these tools were grasped by the fingers rather than gripped by the whole hand.

Polishing stones have the following distribution: El-56, Oe-172, Pe-67, Pe-78, and Pe-79 (2).

SHELL AND BONE ARTIFACTS

Olivella Beads

Three small spire-lopped *Olivella* beads were recovered from two sites in Pershing County, Nevada, Pe-67 and Pe-68. These sites are both open camp sites located in large dunes adjacent to the Humboldt River. One shell bead was found at Pe-67; the others were found at Pe-68 (Pl. 32, *a*).

The three beads appear to be *Olivella biplicata shells,* a Pacific Coast shell species. The beads are simply small *Olivella* shells exhibiting spire and orifice grinding. They range from 0.65 to 0.7 em. in diameter. Gifford (1947: 11) apparently did not describe this type of bead, but in the Lillard, Heizer and Fenanga typology, sueh specimens are designated as type 1a beads (Bennyhoff and Heizer 1958: 62). Type 1a *Olivella* beads are commonly found at sites in the western Great Basin, particularly in Pershing County and in Churchill County (ibid.). Grosscup (1960: 57) lists type 1a *Olivella* shell beads as one of ten traits which appear in Early and Transitional deposits of Lovelock Cave, but not in later deposits. This means that components of Pe-67 and Pe-68 could possibly date back to some 2000 years B. C., though they may be younger, as trade in simple spire-lopped *Olivella* beads apparently reappeared in Phase 1 of the Late Horizon in Central California.

Mussel Shell Pendant

One small perforated fragment of mussel shell *(Margaretifera margaretifera?)* was found at Oe-153 in Owyhee County, Idaho (Pl. 32, *d*). It resembles a pendant, although mussel shell is notoriously friable. The pendant is 1.5 em. long, 1.3 em. wide, and 0.2 em. thiek. The perforation is 0.2 em. in diameter. The pendant is broken, but, if eomplete, it would resemble Gifford's (1947: 93) type U4b *Haliotis* pendant from California. This type is more or less triangular in outline. A fresh water mussel shell pendant attributed to the late pre-contact and early post-contact Northern Paiute was found in Tommy Tucker Cave, Lassen County, California (Fenenga and Riddell 1949: 211, Fig. 58, *b*).

Incised Bone Object

One worked bone object was recovered from Pe-67, Pershing County, Nevada (Pl. 32, *d*). The specimen is from a small mammal—a section of a rib—broken at both ends. It is 2.0 em. long, 1.0 em. wide, and 0.3 em thick. Both faces of the rib fragment exhibit polish and longitudinal striations. One faee bears numerous horizontal incisions which create a sort of crosshatched pattern with the vertical incisions. This bone specimen, possibly a bone die fragment, was the only worked bone objeet recovered by the survey.

UNMODIFIED SHELL AND BONE SPECIMENS

Shell

Small collections of river mussel shell were made at 15 sites. These mollusks have not been identified as to species, but it is presumed that *Margaretifera margaretifera* is represented, since the collections were made along the Snake River and its tributaries (Pl. 34, *a, b, c, d, e, f, g, h*). River mussel shells were collected at the following sites: El-50 El-55, El-56, El-57, El-58, El-60 and El-62 in the Payette subsections of the Columbia Plateau physiographie province; Oe-135, Oe-153, and Elk-32 in the Owyhee Uplands; Hu-35 and Hu-38 in the Northern Lahontan Basin; and Pe-71 and Pe-74 in the Carson-Humboldt Basin.

Small pond mollusks, *Helisoma, Lymnaea, Physa and Pisidium* were eolleeted at four sites, one located in the Owyhee Uplands, and the others located in the Carson-Humboldt Basin. The specimens were collected at Oe-156, Pe-67, Pe-68 and Pe-72 (Pl. 33, *a, b, c*).

Bone

Unmodified bones and bone fragments believed to represent modern fauna were collected at 15 sites. One fossil bearing locality was also located, and the identified fossils are reported in Appendix A. The modern bones, not identified, are from both large and small mammals ranging in size from rodent-sized creatures to animals as large as deer. The collection came from the following sites: El-53, El-56, El-58, El-62, Oe-135, Oe-138, Oe-147, Oe-149, Oe-151, Oe-167, Hu-33, Hu-36, Hu-39, Hu-40, Pe-67, Pe-71 and Pe-82.

DISTRIBUTION OF POTTERY

Site	Bases	Walls	Rims	Total	Remarks
El-56	0	2	0	2	One Vessel
EL-58	0	3	0	3	One other pottery type
El-62	0	2	0	2	Two vessels
Oe-137	0	3	0	3	One vessel
Oe-145	1	9	0	10	Lot 1, Riddle Textile-Impressed
Oe-145	3	22	0	25	Lot 2, one vessel
Oe-145	12	235	8	255	Lot 3, Riddle Textile-Impressed
Oe-167	0	1	0	1	
Totals	16	277	8	301	

POTTERY

Pottery has a rather restricted distribution along the pipeline. The entire collection of potsherds came from six sites in Elmore and Owyhee Counties in Idaho.

Shoshoni Ware

The bulk of the pottery has been identified as Shoshoni ware. Potsherds and vessels of this ware repeatedly turn up in amateur collections and at archaeological sites in Utah, Idaho, Wyoming and other northern and western states. Vessels and sherds of Shoshoni ware are easily identified. When complete vessels are found, they generally exhibit a flower pot shape, although bucket shapes and vessels with rounded bottoms occur now and again. The potsherds characteristically have a dull brown surface finish, obliterated coils, and wiping marks. The range of vessel forms and the total distribution of Shoshoni ware are still incompletely known, although wherever the pottery occurs, Shoshonean speaking peoples formerly occupied or periodically visited those areas.

Shoshoni ware's place of origin is still an open question. It has long been recognized that pottery appeared rather late in the northwest states. That is, whenever stratified sites are excavated, and pottery from them is analyzed, Shoshoni ware is generally found in the topmost or youngest cultural levels which date back only three or four hundred years. Did the idea of pottery-making diffuse northward from pottery centers in the southwestern United States, or did it reach Shoshonean peoples from other sources to the north or east? The following data on Shoshini ware found along the pipeline adds another piece to the puzzle.

Shoshoni pottery from Idaho was first described by Louis Schellbach in 1930. Since that time, a number of other reports have appeared in which pottery vessels made in the Shoshoni tradition are described. DeLaguna (1947), Rudy (1953), Wedel (1954), and Tuohy (1956) all made such contributions. Recently, three other papers (Kehoe, A. 1959; Hunt 1960; and Gruhn 1961a) have added new data on Shoshoni pottery found at both ends of the Basin and beyond. Shoshoni pottery types are now being defined largely on the basis of thin-section analysis of potsherds. While no such analysis of the pipeline specimens was attempted, a new variety of Shoshoni ware, Riddle Textile-Impressed, is herewith described and tentatively assigned candidaey for type status (Pl. 35, *a*, *b*, *c)*

Type Site: Flying H Ranch, near Riddle, Idaho

Color: Surface color is within the range previously described for Shoshoni ware — from light brown to very dark grey. Interior surfaces frequently exhibit carbonaceous material.

Core Color: Brown through dark grey

Lustre: Dull

Surface Texture: Wiping gives appearance of crazed surface; rather rough and coarse to the touch.

Surface Finish: Coils not completely obliterated; exterior and interior surfaces were wiped or brushed with pliant material.

Thickness: Range—0.45 cm. at rim to 1.35 cm. at base

Hardness: Possibly ranges between 4 and 5 on Mohr's scale.

Temper: Final description must await thin-section analysis; however, much biotite mica is evident, along with larger, angular fragments of a light-colored rock or mineral. Amount—moderate; texture—finer than that previously described by Tuohy (1956).

Shapes: Type IIIA2, after Colton (1953: 44).

Side walls taper or pinch inward to a straight rim with a rounded lip. Vessel form—flanged based, flat-bottomed bowls with wide mouths—typical Shoshoni ware vessel form. Other forms not known at present, although there is no indication of vessels with rounded bottoms in the survey collection.

Decoration: The bases of two vessels show distinct impressions of textiles, probably baskets or mats. The impressions, in both cases, are on the bottom side of the base. One group of base sherds from a single vessel show the impressions of a twined or twill-twined mat or basket having 3 weft elements per cm. Individual weft elements average 0.25 cm. in width. Warp elements are spaced at an interval of 2 per cm. Stitches lean up to the right (Pl. 35, *b, c)*.

The other specimen, a single basal sherd, exhibits what appears to be indentations formed by a badly worn coiled basket. The stitch interval appears to be 6 or 7 per cm. Warp intervals cannot be determined. Warps apparently were bunched bundle splints split by the stitches, although the impression is much too shallow to permit analysis.

Techniques: Method of construction—coiling, with the coils partly obliterated; surface treatment—both exterior and interior walls of vessels were wiped with a pliant material; firing—fired in a reducing atmosphere, temperature uncontrolled.

Function: The vessels apparently were used as simple cooking pots.

Other Features: Mending holes—0.55 cm. in diameter, drilled from only one side.

Comparisons: While the Riddle Textile-Impressed variety appears similar in many respects to Shoshoni ware found elsewhere in Idaho, the presence of textile impressions on the bottom side of the base sets these vessels apart from previously described examples. (Although Jennings (1957: 209) did recover similar basketry casts from Danger Cave, they were unfired clay). A third vessel bearing textile impressions on the bottom side of the base was found while examining the Nevada State Museum's pottery collection. It is complete and stands 30.0 cm. high. The base is 9.1 cm. in diameter. At the lip, the maximum diameter is 31.9 cm. The impressions are apparently those of a twined mat having 2 warps per cm. and 3 wefts per cm. Warps are 0.35 cm. wide. The vessel is on loan to the Museum by Mr. Sam Tooley of Ashland, Oregon. The vessel was found at a spring near Metropolis, Oregon. The catalog number is 288-L-1 (Pl. 35, *a)*.

Closest affinities lie with the flat, flanged bottomed Shoshoni ware vessels made in the "Shoshoni tradition", and previously recovered on the northern Plains (Mulloy 1958: 196-200; Kehoe, A. 1959: 237-38; Wedel 1954; 403-409), in Idaho (Tuohy 1956: 55-71), western Utah (Rudy 1953: 94-98), southern Nevada (Baldwin 1950), and southeastern California (Riddell, H. 1951: 20-23; Hunt 1960: 204-207). Gruhn (1961a: 98) recently described a new type of Shoshoni ware called "Wilson Butte Plain". This ware apparently includes vessels with rounded bottoms or bases and fingernail indentations on the lip of the rim. As previously stated, not one of the pipeline sherds shows such characteristics.

Discussion: The presence of textile impressions upon basal sherds and bases of Shoshoni ware vessels has not previously been reported. For the first time, flanged, flat-bottomed Shoshoni ware vessels may be tied to specific textile types.

In examining the basal sherds which contain the impressions of twined fabrics, it is apparent that the lump of clay which ultimately formed the base of the vessel was deliberately pushed into the fabric, and not moved or removed until the clay had become "leather hard". Less can be said about the basal sherd showing the imprint of a worn coiled basket, for the impression is very shallow and difficult to discern. It is possible that bases for Riddle Textile-Impressed vessels were placed on mats or on basketry fragments to facilitate construction of the vessel. Whatever the explanation may be, the presence of textile impressions on Shoshoni pottery hints of Eastern Woodlands affinities rather than Southwestern ties. However, Mohr (1962) has recently explained that the use of the paddle and anvil for making Woodland pottery is one of the traits which most strongly suggests linkage with Asia; the technique is not well represented by Jomon pottery of Japan, but on the Asiatic mainland. The vessels described in this report were made by coiling.

Other Pottery Types

In addition to the Shoshoni ware sherds and the Riddle Textile-Impressed sherds, which make up the bulk of the survey collection, two other potsherds were collected which apparently represent other varieties of Shoshoni ware, or other wares. The first of these is a single sherd from El-58. This sherd has a smooth polished exterior surface, buff in color. It is 0.55 cm. thick. It may be a sherd of Deep Creek Buff, although this identification is tentative.

The second sherd appears to have been part of a thin-walled vessel, 0.64 cm. thick. This sherd also exhibits exterior smoothing. It is dark brown in color, however, and not otherwise similar to the buff-colored specimen. It is tentatively identified as an undescribed variant of Shoshoni ware. It was found along with two Shoshoni ware potsherds at El-62.

POST-CONTACT ARTIFACTS

Some of the following artifacts of white manufacture were brought into the pipeline survey area by early trappers, travelers and miners, while others date from more recent times. Metallic objects will be described first, then those of glass and other materials. All of them, with a few exceptions noted in the following paragraphs, were recovered from the surface of archaeological sites.

Metallic Objects

Musket Barrel. A musket barrel bearing the date "1844" was recovered at Oe-145 (pl. 39). The breech end of the barrel lay partially covered by a flat basalt boulder. A study of this piece was made by H. J. Swinney, Director of the Idaho State Historical Society Museum in Boise, Idaho. His study appears as Appendix B of this report.

Brass Hinge. A small rectangular brass hinge was also found at Oe-145 (Pl. 36,*a)*. The hinge has a perforation near one end, and it might have served as an ornament. A single inscription, the letter "Q", occupies the middle of the obverse face of the hinge.

Cartridges. A single .44 caliber brass cartridge was found at Oe-172 (Pl. 36, *c)*. It bears the following inscription: "UMC-44 WCF".

Horse or Mule Shoes. Horse shoes or mule shoes were recovered at El-58, Oe-141, and at the Buckskin Mill ruins, a mill near Paradise Valley, Nevada which dates from the days of the gold rush.

Hand Plow. A hand plow dating from the early 1900's was found at Hu-39 in Humboldt County, Nevada.

Miscellaneous Metal Objects. Included in this group are three horse shoe nails from El-55, a fragment of a spade from Oe-139, a metal loop from Oe-160 (Pl. 36, *g, d)*, a metal ring from Oe-166 (Pl. 36, *h)*, a beveled steel spike (Pl. 36, *i)*, and an enameled metal bucket from Oe-167, a square nail from Hu-39 (Pl. 36, *f)*, a small steel cylinder (Pl. 36, *e*), and a copper canteen from Pe-67 (Pl. 37, *b*), and a rusted metal punch from the ruins of a Wells Fargo Stage Station near Imlay, Nevada (Pl. 36, *j)*.

Objects of Glass and Other Materials

Bottles. Two bottles were collected (Pl. 37, *a, c)*. A blue-green bottle with a rectangular body and a long thin neck was found at Oe-172. A hand-blown thick green glass beverage bottle with an indented base like that of a champagne bottle was picked up along the right-of-way in Pershing County, Nevada. Pieces of bottles and other glass ware, turned purple by the sunlight, were found at El-58 and at the ruins of the Wells Fargo Station near Imlay, Nevada.

Buttons. Modern shell buttons of various sizes were recovered at El-58, Oe-141, Oe-145, and Oe-172 (Pl. 32, *c, f)*

Glass Bead. A single globular shaped blue glass bead, 0.9 cm. in diameter, from Hu-29, completes the inventory of post-contact artifacts recovered at archaeological sites during the course of the survey (Pl. 32, *b)*.

PART VI

COMPARISONS

In relating the findings of the pipeline survey to existing data on past cultures of the Great Basin and western Snake River Plain, it should be remembered that chronological controls usually provided by stratigraphic excavations are lacking for the artifacts described in this report. Suggested dates for the various tool types, and particularly projectile points, will be arrived at by comparisons with data from excavation sites which have yielded relative dates for similar artifact types. Excavation and survey reports of sites in close proximity to the pipeline route will be considered first.

SOUTHWEST IDAHO.

In southwest Idaho, along the western Snake River Plain and in areas immediately adjacent to the plain, two archaeological survey reports, (Swanson, Tuohy and Bryan 1959; Swanson, Bryan and Powers n.d.) notes on two archaeological collections, (Gruhn 1961b; 1961c), and excavation reports of three caves (Gruhn 1960; 1961a; Tuohy and Swanson 1960) and one open site (Bowers and Savage 1962) are the potential sources of comparative data. Although two of these reports would be of value in making comparisons, they are not available to me at this writing. These are the Bowers and Savage (1962) excavation report of an open site on Brown's Bench, part of the Owyhee Uplands located just south of the Snake River Plain of central Idaho, and the Swanson, Bryan and Powers (n.d.) manuscript reporting an extensive survey in southwestern Idaho. Thus, the number of papers available for comparisons is reduced to six. Two of them, the survey report by Swanson, Tuohy, and Bryan (1959), and an excavation report by Gruhn (1961a), are of primary importance to the study of Snake River Plain archaeology.

The survey report (Swanson, Tuohy, and Bryan 1959) was the first systematic attempt to assess the archaeological potential of the state of Idaho. A number of proposed reservoirs and adjacent regions along the Snake and Salmon River systems were surveyed. The report is largely a descriptive one which presents the types and distributions of site features and stone tools in southern and central Idaho. Despite the presence of point types known to occur in demonstrably "early" contexts elsewhere in the west, chronological ordering of the surface materials was not attempted. Thus, the report emphasizes one dimension in archaeology, that of spatial relations of site features and stone tool types. Culture horizons were not delineated.

Site features reported which were also found along the pipeline route were peeked petroglyphs, circular house .(?) depressions, talus pits, and oval rock alignments. These features are widespread in southern Idaho, and the pipeline data extend the range of them deep into southern Owyhee County.

While the design elements of petroglyphs of southern Idaho have not yet been analyzed, the author has little doubt that they will prove to be in Great Basin Curvilinear and Rectilinear Abstract Styles (Heizer and Baumhoff 1962). These styles of petrography are well represented in northern Humboldt County, Nevada at pipeline sites Hu-42 and Hu-43. The existence of design elements at Hu-43 executed in the Great Basin Scratched Style of petrography extends the known range of that style northward into Humboldt County, Nevada. I have not found this style reported in southern Idaho.

The term "circular house depressions" as used in the survey report, (Swanson, Tuohy, and Bryan 1959), encompassed a variety of circular pits in the ground, located in central and southern Idaho. Only one such depression was found by the pipeline survey, at Hu-21 in northern Humboldt County, Nevada. Since the size range of the Idaho depressions is from 18 to 30 feet in diameter, and the maximum diameter of the depression at Hu-21 is about 12 feet, it may be that two or more fundamentally different types of structure are represented.

Talus pits were not recorded along the Snake River system during the earlier survey. At that time, the known distribution of talus pits in Idaho was restricted to the Salmon River

basin in the central part of the state. I believe that the range of these structures extends along the Snake River as well, and that the talus pits found at El-53 in Elmore County, Idaho and Oe-170 in Owyhee County, Idaho are not isolated occurrences, but represent a widely distributed trait in the Columbia Plateau and the northern Great Basin.

Oval rock alignments up to six feet in length and three feet in width were also mentioned in the survey report (Swanson, Tuohy, and Bryan 1959). Their distribution was not plotted at that time, but such structures are not uncommon along the Snake River Plain. Two known to me are quite far apart, one being located in eastern Idaho, and the other in Craters of the Moon National Monument in central Idaho. The semi-circular, circular, and oval rock alignments recorded at pipeline sites Oe-169 and Oe-171 in central Owyhee County are, again, specific occurrences of a widely distributed pattern found in the Great Basin and Columbia Plateau.

Types of features recorded by the earlier survey but not found along the Nevada Northern pipeline route in southwestern Idaho include the following: tipi rings, boulder rings, earthworks and pictographs, These features, however, tend to have a more northerly distribution in Idaho where they are largely associated with forested mountain and foothill regions.

Types of features found along the pipeline route but not reported in the 1959 survey include the two rock cairns and six bedrock mortars recorded in central Owyhee County at sites Oe-145 and Oe-167.

Comparisons between Idaho projectile point types described in the 1959 survey and those described in this report show that 17 of 77 Idaho point types are represented in the pipeline surface collections. These are Idaho point types 1, 2, 3, 4, 6, 17, 49, 52, 53, 54, 55, 56, 62, 77, 81, 83 and 91, previously noted in the comparative section of the point type descriptions. Not listed in those sections are an additional 25 types from Idaho which only resemble pipeline types and sub-types. Projectile point types being a trait with diagnostic value in ascertaining culture horizons, the points in question here will be further considered in the discussion at the end of this chapter, in the context of larger cultural relations.

Pottery, another trait with diagnostic value, was well represented in the survey collections (Swanson, Tuohy and Bryan 1959). The distribution of Shoshoni ware and its variants has already been discussed (see Pottery, p. 62). The distribution of pottery along the pipeline route terminates near the East Fork of the Owyhee River, some 25 miles north of the Idaho-Nevada border. Thus, the Owyhee Uplands may be counted as another Idaho province where the craft of pottery making was known to the protohistoric and, probably, late pre-historic peoples. It is of interest to note that along the pipeline route pottery was not found in territory usually assigned to the Northern Paiute of Nevada. The Northern Paiute of Oregon, on the other hand, apparently obtained vessels from the Snake River Shoshoni, as vessels and sherds occasionally are found in that state.

The second study of primary importance to Snake River Plain archaeology is an excavation report of a stratified cave site, Wilson Butte Cave, in south-central Idaho (Gruhn 1961a). Gruhn spent two summers at this site carefully excavating the deposits in a large lava blister on the lava plateau of the Snake River Plain. The result was an interpretive model of southern Idaho culture history — a model based upon six assemblages of perishable and imperishable artifacts found in stratigraphic sequence. Chronological controls, buttressed by three radiocarbon assays, geological stratigraphy, and shifts in dominant faunal assemblages associated with the strata, indicated that man had utilized the cave since the beginning of the Anathermal period, about 8000 B. C.

Using stone projectile points as sensitive and reliable indicators of cultural successions, Gruhn (1961a: 139-156) was able to block out intercultural relationships and to define cultural horizons in southern Idaho. The two earlier assemblages, Wilson Butte I and II, apparently are not represented in the surface collection from the pipeline route, and therefore comparisons may be made only with Wilson Butte III, IV, V, and VI (Dietrich Phase) assemblages.

According to Gruhn (1961a: 149), Wilson

Butte III apparently dates around 5000 B. C., and its characteristic artifacts are stemmed, indented base points. At Wilson Butte, this point type is thought to be indicative of a Desert Culture expansion northward out of the Great Basin during the terminal Anathermal period. The stemmed, indented base points from Wilson Butte, types 8a and 8b, are comparable to types 31 and 31a from the pipeline collection. Along the pipeline route, such point types were recovered from the surface of sites in southern Owyhee County, Idaho, and northern Humboldt County, Nevada, areas corresponding with the Owyhee Uplands and the northern Lahontan Basin physiographic subsection.

The Wilson Butte IV assemblage is characterized by both large side-notched points and small, shouldered points similar to Pinto types. This may indicate a blend of two traditions, according to Gruhn (1961a: 149): "The Pinto points suggest continued ties to the south, but the large side-notched points also occur elsewhere outside a Desert Culture context". Points like the small, shouldered one which Gruhn includes as part of Assemblage IV at Wilson Butte (Gruhn 1961a: Plate 35, A, B), were not recovered along the pipeline route, but medium to large side-notched points are represented in the survey collection. Pipeline sub-types 29a, 30b, and 30c, in particular, can be equated with Wilson Butte IV point types 9b, 9c, and 9d respectively. The Wilson Butte IV assemblage appears to date back about 4500 years B. C. The three comparable pipeline point types have a more or less continuous distribution from Elmore, Idaho to Pershing County, Nevada.

Wilson Butte V point types 3, 4b, 5a, 5b, 5c, 6b, 7b, 9d, 11c, 11d, 12a, and 12b can be equated with pipeline types 4a, 2, 3b, 8, 3c, 3a, 14, 30c, 35b, 21e, 34, and 23 respectively. The Wilson Butte V assemblage appears to date from the beginning of the Medithermal period or roughly from 2000 to 500 B.C. (Gruhn 1961a: 149). The distinctive point types of Wilson Butte V apparently represent a cultural thrust out of the Great Basin northward onto the Snake River Plain, and thence northeastward onto the western margin of the Great Plains (Gruhn 1961a: 150). The presence of many point types from the pipeline route equatable with Wilson Butte V point types tends to support this view.

Wilson Butte VI, defined by Gruhn (1961a: 143) as the Dietrich Phase, is identified as an assemblage of both "hard" and "soft" classes of artifacts attributed to the Shoshonean peoples of the Snake River Plain. Gruhn's discussion of the Dietrich Phase material at Wilson Butte and its broader cultural relations is excellent, and the reader is referred to her presentation (1961a: 143-148). I shall limit comparisons to the distinctive Desert Side-notched points, other small point types, and Shoshoni ware pottery. Gruhn (1961a: 148) estimates that the Dietrich Phase dates back to about A.D. 1300-1400.

Dietrich Phase point types 6a, 13, 10a, 12b, 12c, 10b, and 12a are represented in the pipeline collection by point types 1, 11, 18, 23, 24, 29, and 34 respectively. The Desert Side-notched point, Wilson Butte type 10b and pipeline type 29, appears to be the same as the Sierra sub-type (Baumhoff and Byrne 1959). This sub-type apparently has a widespread distribution in the Intermontane west. It is surprising to find, therefore, that the pipeline distribution of this sub-type is rather restricted. It was not found at pipeline sites south of the Owyhee Uplands in southwest Idaho. Elsasser (1958: 40) also noted the conspicuous absence of Desert Side-notched points at certain sites in the western Great Basin, although such points commonly occur in the area. It may be that the Nevada sites recorded on or near the pipeline had been thoroughly gleaned by collectors, and that the small side-notched points were first to disappear.

Pottery from the Dietrich Phase of Wilson Butte Cave was a distinctive type, Wilson Butte Plain ware. This ware, a type of Shoshoni pottery, is not represented among the sherd collections from the pipeline. The Riddle Textile-Impressed pottery from the pipeline (see p. 62) has many attributes which are equatable with Wilson Butte Plain ware; however, Riddle Textile-Impressed is more closely related to the traditional flat-bottomed flower pot forms of Shoshoni ware. Indeed, Riddle Textile-Impressed may be considered a variety of the latter type.

The next report to be considered, less comprehensive than the first two, is Gruhn's (1961b: 1-18) description of a collection of

artifacts from Pence-Duerig Cave near Twin Falls, south-central Idaho. This cave, dug in 1937 by personnel from Idaho State College, yielded classes of artifacts made of stone, bone, wood, and other vegetable material, as well as basketry and Shoshoni ware pottery. While the artifacts were kept for future study, provenience data was not preserved. Gruhn (1961b: 17) believes that the Pence-Duerig Cave collection can be equated with the Dietrich Phase assemblage from Wilson Butte Cave, and that some of the differences that exist between the two assemblages may be a reflection of economic factors as well as stylistic factors. She suggests that two distinct though culturally related social groups are represented at the two sites (Gruhn 1961b: 17).

Projectile point types, 4, 5, 2, 3, 7, 10c, 11, and 10b from Pence-Duerig Cave are comparable to pipeline types and sub-types 1, 3, 4, 8, 9a, 24, 30c, and 34. Other classes of stone tools from the cave may also be related to pipeline types.

Shoshoni ware pottery of the traditional "flower pot" form was also a part of the Pence-Duerig collection. This type differs from the round-bottomed Wilson Butte Plain ware, but it is similar to Riddle Textile-Impressed, lacking only the textile impressions. Thus, the overall similarities between the Pence-Duerig point types and pottery, and the pipeline specimens, are noted.

The fourth report is of the Mecham site, also located near Twin Falls, Idaho, and also excavated and reported by Gruhn (1960). It is a small rockshelter which contained a single adult female burial and accompanying grave goods. The chipped stone artifacts associated with the burial—projectile points, scrapers and knives—show marked resemblance to several pipeline artifact types. Mecham points types 1a, 1b, 2, 3, and 4 can be equated with the pipeline types and sub-types 21, 23, 34, 30, and 4 respectively. Also found with the burial were 27 *Olivella biplicata* shell beads, type 1a in the Bennyhoff and Heizer (1958) classification. Beads of this type were recovered at only two pipeline sites, Pe-67 and Pe-68 in Pershing County, Nevada.

Since the small Mecham point types 1b, 3, and 4 were not in direct association with the burial, as were point types 1a and 2 and the *Olivella* beads, and since small spire-lopped *Olivella* beads in the Great Basin show closer relationships to the Early Horizon in central California rather than the Late Horizon, it seems likely that Gruhn's guess-date for the age of the burial as between A.D. 700 and A.D. 1200 is too late.

The fifth source of comparative material, Site 10-AA-15, a stratified rockshelter in the Snake River canyon south of Boise, Idaho, was excavated in 1958 (Tuohy and Swanson 1960: 20-24). Two classes of artifacts, pottery and stone projectile points, show relationship to pipeline specimens. Shoshoni ware pottery sherds were recovered in the topmost or youngest occupation level of the shelter. These sherds are comparable to Shoshoni ware potsherds from the pipeline.

The final paper reporting archaeological finds in southwest Idaho is Gruhn's (1961c: 37) report of a small collection of artifacts associated with a young adult burial in Canyon County, Idaho, north of the Snake River near the village of Melba. The collection consists of a fragment of coiled basketry, a crude scraper, a wooden cylinder, and an obsidian core. These artifacts are not represented in the pipeline collection.

NORTHERN AND CENTRAL NEVADA

Excavation and survey reports of northern Nevada archaeology are not numerous. Recent investigations have been centered east of the pipeline route in Elko County, Nevada. Two of the more important excavations were conducted at Deer Creek Cave (Shutler and Shutler n.d.) and at Ruby Cave (Baumhoff n.d.) Although the reports have not been published, study collections and line drawings of projectile point types from these two sites are available for comparisons.

West of the pipeline route in the northern part of Nevada the primary source is another report of a cave excavation, Massacre Lake Cave (Heizer 1942: 121-123). Cressman's researches in the northern Great Basin of south-central Oregon also have yielded comparative collections of artifacts and a theoretical framework for interpreting the archaeology of the northern Great Basin (Cressman 1942).

Elsewhere in the Great Basin of west-central

Nevada and north-eastern California several cave explorations have been carried out (Loud and Harrington 1929; Heizer and Krieger 1956; Fenenga and Riddell 1949; Heizer and Baumhoff 1961; Grosscup 1956; Heizer 1956; and Shutler, Rozaire and Shutler n.d.). These reports together with survey information (Elsasser 1958) and an important report of a large open habitation and burial site (Riddell, F. 1960) constitute some of the more important publications from which comparisons may be drawn.

While the comparisons which follow shall stress only one class of stone tools, projectile points, it should be remembered many classes of perishable and imperishable artifacts were recovered at some of these caves, and a comparison of only one class of stone tools from these sites may present a skewed picture of cultural relations. On the other hand, one of the pressing problems in Nevada archaeology is the need for seriational studies of projectile point types at open sites in order that such sites may be related to culture horizons known only in caves.

At least 38 point types and sub-types, recovered at Deer Creek Cave near the Jarbidge River Canyon in Elko County, Nevada, are represented in the pipeline collection (Shutler and Shutler n.d.). The points from Deer Creek Cave are available for study at the Nevada State Museum, and they were personally inspected. Pipeline point types 1, 2, 3, 3a, 3b, 4, 4a, 4c, 4e, 9, 11, 13, 17a, 17b, 17c, 21, 21a, 21b, 21d, 21e, 22, 23, 23a, 23b, 23c, 24b, 25, 29, 29a, 30, 30a, 30b, 30c, 31, 31a, 31b, 34, and 35b, seem equatable with similar sub-types from Deer Creek Cave. It is my impression that the collection of points from the various levels of Deer Creek Cave has much in common with point types from Wilson Butte Cave on the Snake River Plain in Idaho.

Several point types from Ruby Cave in Elko County also bear close resemblances to pipeline specimens. Among these, pipeline types and sub-types 20, 22a, 30c, 31b, and 34 seem most closely related. These pipeline types correspond with Baumhoff's (n.d.) types I, II, III, V, and possibly VI. Types I through III at Ruby Cave are smaller and stratigraphically later types, while types IV through VI are stratigraphically older types.

At least three Massacre Lake Cave point types are also represented in the pipeline collection. This cave is located in the northwestern corner of Nevada in Washoe County. In the excavation report, Heizer (1942: 143) wrote: " . . . . Massacre Lake cultural forms are most closely related to those in south-central Oregon, yet at the same time certain features are reminiscent of types from the Nevada caves to the south". Pipeline point types 11, 29, and 30b apparently have cognates in types 2, 4, and 5 reported from Massacre Lake Cave (Cressman, Williams, and Krieger 1940: 42).

For comparison of point types with those found in another portion of the northern Great Basin, the Honey Lake region of Lassen County, California, the Karlo Site, Tommy Tucker and Amedee Caves are of outstanding importance.

The Karlo Site, a deep open habitation and burial site, (Riddell, F. 1960) is an open site manifestation of Lovelock culture coeval with the Early through Late Stages of Lovelock. It is also coeval with the terminal Early, Middle and Late I Horizons of central California which places the beginning of the Karlo period about 4000 years before the present (Riddell 1960: 91). Karlo projectile points in part show marked resemblances to points from Danger Cave, Utah (Jennings 1957), but the Karlo Site, according to Riddell (1960: 86) is more closely allied to Lovelock culture than it is to the broadly defined Desert Culture (Jennings and Norbeck 1955).

Tommy Tucker Cave and Amedee Cave were excavated by Riddell and others (Fenenga and Riddell 1949; Riddell, F. 1956a; Riddell, F. 1956b). Tommy Tucker Cave yielded artifacts attributed to Late Lovelock people and protohistoric and early post-contact Northern Paiute. It also exhibited possible Middle Lovelock affinities. Amedee Cave deposits also extend from Late Lovelock into the protohistoric Northern Paiute period, but the latter phase differs slightly from the upper levels of Tommy Tucker Cave. Thus the temporal range of artifact types from these caves extends from about 500 B. C. to A.D. 1850-1900.

Riddell (1960: 26-27) has noted that several

types of projectile points from both Tommy Tucker and Amedee Caves are represented at the Karlo site. Karlo types 1, 2, and 3 are most popular at Tommy Tucker, while Karlo types 1, 3, and 5 are most popular at Amedee. Karlo types 1, 2, and 3 from Tommy Tucker are comparable to sub-types 2, 3a, 22a, and 21 from the pipeline, while Karlo types 1, 3, and 5 are comparable to pipeline sub-types 2, 3a, 21, 29, and 30a. Other Karlo types which seem to be duplicated in the pipeline collection include all Karlo types except types 4 and 8. Pipeline sub-types with cognates at Karlo are the following: 2, 3a, 4, 4a, 5, 9a, 19, 21, 22a, 29, 30a and 31. Thus, strong relationships between several pipeline sites and the later phases of Lovelock culture and Dune Springs and Amedee phases of the western periphery of the Great Basin are indicated.

While Lovelock culture is represented in the caves of the Honey Lake region of northeastern California and in part at Massacre Lake in northwestern Nevada, Lovelock culture type sites, Lovelock Cave (Loud and Harrington 1929) and Humboldt Cave (Heizer and Krieger 1956), are located near the Humboldt Sink in southern Pershing County and northern Churchill County, Nevada. The surface archaeology of the Humboldt Sink region and the upper levels of nearby Leonard Rockshelter (Heizer 1951:94) also contain Lovelock culture elements. Lovelock culture is also present in the upper midden of Hidden Cave, located in the Carson Sink region of Churchill County, Nevada (Grosscup 1956: 61), and in caves of the Pyramid Lake area (Roust 1958), as well as in caves of the Winnemucca Lake region in southwestern Washoe County (Orr 1952; 1956; Shutler, Rozaire and Shutler n.d.). These caves are all located in or near the Lahontan system of basins, and all have yielded perishable artifacts such as basketry, mats, and nets in quantity, but in few of them have many projectile points been found. As Riddell (1960: 85) points out, the type sites, Lovelock and Humboldt Caves, apparently served primarily as repositories for cached goods. The same may be said about other caves in the region.

It is possible, nevertheless, to compare the few point types recovered from these caves of west-central Nevada with the pipeline specimens. Lovelock Cave "obsidian arrowpoints", Loud and Harrington's collection of projectile points reported by Grosscup (1960: 18), include four specimens, 13-4895, 13-4777c, 13-4777d, and 13-4777e, which resemble pipeline types 31b, 21c, 23c, and 24. Two pipeline types, 23c and 34, are represented in the collection from Humboldt Cave by two SCb2 type points (Heizer and Krieger 1956, Plate 14, e, f). These points from both Lovelock and Humboldt Caves apparently are referable to Transitional or Late Phases of Lovelock culture.

The final report of the Leonard Rockshelter excavation has not been published. The preliminary report (Heizer 1951, Fig. 40g) illustrates only one point from the upper stratum of the Lovelock culture component of the rockshelter. This point does not resemble any of the pipeline sub-types.

The surface archaeology of the Humboldt lake bed (Loud and Harrington 1929, Appendix I), considered an open site expression of Lovelock culture (Heizer 1951: 94), contains a collection of 1052 chipped stone implements, but these were not described in the Lovelock Cave report. A collection of artifacts from one of these open sites near the Humboldt Sink, 26-Ch-15, was subjected to study, but again, the report (Heizer and Grosscup n.d.) has not been published. Elsasser (1960: 70) has compared Martis Complex point types with those from 26-Ch-15, however.

A small collection of points from Hidden Cave, Nevada is available for study at the Nevada State Museum. These points from the Carson Sink area in Churchill County show some degree of relationship to the pipeline specimens. The smaller points from the upper midden, or Lovelock component of the cave, appear similar to pipeline sub-types 4c, 4e, 9a, 10, 14, 14c, and 31a. The larger "dart" points from Hidden Cave apparently are not represented in the pipeline collection.

Another collection of points from a series of caves, rockshelters, and open sites near Falcon Hill, Washoe County, Nevada was also examined at the Nevada State Museum (Shutler, Rozaire and Shutler n.d.). Only a few of the smaller point types, tentatively ascribed to Late Lovelock and, perhaps, Northern Paiute components at these sites, are represented in the pipeline collection. Again, the larger

"dart" points and knives from Falcon Hill are not duplicated in the pipeline collection.

Two sites remain to be discussed, Wagon Jack Rockshelter near Eastgate, Churchill County, Nevada (Heizer and Baumhoff 1961), and an implement-making site in Pershing County, 26-Pe-5, first discovered by Loud (Loud and Harrington 1929), and later reported by Elsasser (1958: 26). These sites have not yet been dated, although cultural and chronological relations have been suggested for both of them.

Wagon Jack Rockshelter yielded 13 types of projectile points. A line drawing of each specimen was presented in the report. While not all the specimens in a named type from the shelter have cognates in the pipeline collection, certain individual specimens within the type groups do resemble pipeline sub-types. Thus, for example, two Rose Spring Corner-Notched points, (the references to figures in the following sentences are from Heizer and Baumhoff 1961), Fig. 2, d, e, resemble pipeline sub-types 24a and 24b. Three Eastgate Expanding Stem points, Fig. 2, h, m, q, appear similar to pipeline sub-types 21, 32a, and 34. Two Desert Side-notched points, Fig. 3, a, c, are represented by pipeline type 29. An Eastgate Split-Stem point, Fig. 3, m, appears similar to pipeline point subtype 34a. Four Elko Corner-Notched points, Fig. 3, n, t, q, u, have cognates in pipeline sub-types 21d, 22a, 25, and 21a. Four Elko-Eared points, Fig. 4, a, n, q, t, are similar to, but not identical with pipeline sub-types 35a, 22, 31a, and 21c. A single Humboldt Concave Base A point, Fig. 5, a, resembles pipeline sub-type 4e. Two Cottonwood Triangular points, Fig. 5, g, h, are identical with pipeline sub-types 1 and 3. Finally, three Unnamed Leaf-shaped points, Fig. 5, i, m, n, resemble pipeline sub-types 13a, 2a, and 2 respectively.

Although the deposits which yielded the named point types have not been dated with certainty, Heizer and Baumhoff (1961: 123) suggest that the occupation of the shelter began at about A.D. 500. If this date proves accurate, Wagon Jack phase projectile points would be coeval with the Dune Springs phase of west-central Nevada and the Amedee Phase of northeastern California.

Site 26-Pe-5, an open site in Pershing County, Nevada is located near the Humboldt Sink. This site yielded a vast assemblage of chipped and ground stone artifacts. The collection of projectile points from Pe-5 is marked by the absence of small Desert Side-notched points. The predominance of small corner-notched, split-stem points and the absence of side-notched points persuaded Elsasser (1958: 47) to tentatively state that ". . . . the site was occupied at some time during the span of occupation of Humboldt and Lovelock Caves, and was not known or used by the Northern Paiute, who presumably occupied the nearby Humboldt lake bed site, 26-Ch-15, at certain times during the protohistoric period".

Eight point types from Pe-5, illustrated by line drawings (Elsasser 1958, Fig. 4, c, d, e, f, j, k, n, and p) apparently can be equated with pipeline sub-types 4c, 1, 3, 14, 14b, 21b, 23a, and 31b, respectively. Other chipped stone artifacts also bear resemblances to pipeline specimens, but a detailed comparison will not be attempted.

DISCUSSION

The types of site features and stone tools, particularly the diagnostic projectile points, found along the pipeline route, are types which have been recovered at other open and cave sites in southwest Idaho and the northern and west-central portions of the Lahontan Basin. My impression is that the open pipeline sites, for the most part, can be equated with Late culture phases of these regions. Wilson Butte IV, V, and VI (Dietrich Phase) of the Snake River Plain, in particular, seem to be strongly expressed in the surface archaeology of the Owyhee Uplands. The Wagon Jack, Dune Springs, Amedee, and Late Lovelock phases of the northern and central Lahontan Basin also seem to be strongly expressed at several pipeline sites. Although components of several pipeline sites may date back some 5000 years B. C., the majority of them probably date from the Late Medithermal period or about A.D. 1 to the present.

There is a truly remarkable degree of similarity of projectile point types found in both early and late prehistoric contexts in the Basin. From the Snake River Plain in Idaho to the tip of the peninsula of Baja California Pinto points or varieties of them repeatedly occur.

Desert Side-notched points, a late time marker in the Basin, apparently earlier in the south than in the north (Baumhoff and Byrne 1959: 61), are almost as widespread. Sites on the western periphery of the Basin, such as the Karlo Site (Riddell 1960), share all point types, save one, with Danger Cave, Utah, some 350 miles to the east. The assemblages of basalt points comprising the Martis Complex of Lake Tahoe and vicinity (Heizer and Elsasser 1953; Elsasser 1960) apparently are related in part, at least, to point types from the Humboldt Lake bed (26-Ch-15), from Mono County (Meighan 1955), and from the Yosemite Park area (Bennyhoff 1956). While points made of basalt were scarce along the pipeline route, several point types, as indicated in the comparative sections of the pipeline point descriptions, do show a relationship to those from the Humboldt Lake bed in Nevada and the Mono County and Yosemite areas of California.

It is apparent that the distribution and comparison of point types is not a local problem, but one which bears upon larger cultural relations in the Intermontane West. I am struck by the open site expression of hunting activity along the northern two-thirds of the pipeline route, and the dearth of archaeological sites there which truly express an economy dependent upon plant foods. Perhaps the sites encountered along the pipeline represent primarily the camps of hunters on seasonal forays in search of small and large game. Rockshelters in the Owyhee Uplands might, when excavated, yield an entirely different picture—one which is more compatible with the expected manifestations of "Desert Culture".

However, while it is clear that the prehistory of the Great Basin, to judge from the distribution of projectile point types, is an interrelated whole, it is also apparent that the "Desert Culture" concept (Jennings and Norbeck 1955) offers a less attractive frame of reference today than it did several years ago. As more local sequences become established, and as new finds are made, the concept of an ancient and persisting culture stratum emphasizing the preparation of plant foods by use of grinding tools has less and less validity, when applied to the Great Basin in its entirety. Wallace (1958: 18), Heizer (1956: 53), and Riddell (1960: 88), among others, were the first to point this out. Furthermore, recent finds of Clovis points in Nevada near Carson City, Beatty, and earlier at Tonopah (Shutler and Shutler 1959; Campbell and Campbell 1940) permit the suggestion that an Early Hunting stage comparable to the Llano Complex will someday be found within the confines of the Great Basin.

Data from the pipeline sites adds to the information necessary for an understanding of culture history in the Great Basin, but more work is needed at open sites, caves, and rockshelters in Idaho and Nevada along the northern periphery of the Basin, so that the data from these areas will be at least comparable to those extant for the western periphery. It seems to the author too early to attempt explanation of similarities and differences in Great Basin cultural expressions, particularly along the northern periphery.

PART VII

SUMMARY

The Nevada Northern pipeline route originates on the western Snake River Plain—the Payette geomorphic province of the Columbia Plateau. It passes diagonally across the rolling basalt plateaus and canyon lands of the Owyhee Uplands, Owyhee County, Idaho, and enters Nevada and northern Lahontan Basin near Paradise Valley, Nevada. The route then proceeds due southwest paralleling the Humboldt River in Nevada. South of Lovelock, it turns west, passes over portions of the Granite Springs Basin and adjacent mountain ranges, and finally arrives at its destination, Reno, in the Truckee Basin. (Note: The pipeline was later extended south from Reno to Gardnerville).

Those portions of the Columbia Plateau and northern Great Basin traversed by the pipeline are, for the most part, high latitude steppe and desert areas characterized by deficient rainfall and great seasonal and diurnal fluctuations in temperature. The Upper Sonoran Life Zone is dominant along the route. Several species of sagebrush, notably *Artemisia tridentata*, and 83 species of mammals occur in this zone.

The historic native peoples of southwestern Idaho and northern Nevada were the Snake River Shoshoni and the Northern Paiute. These peoples spoke related dialects of Plateau Shoshonean or Numian, a branch of the Uto-Aztecan family of languages. Both groups were basically Basin peoples with cultures oriented towards the exploitation of the natural environment for subsistence purposes. In southwestern Idaho and northern Nevada there were no precisely defined enclaves of native peoples, but rather loose agglomerations of native peoples moving with the seasons to exploit available foodstuffs. Along the western Snake River Plain, fishing was an extremely important economic pursuit. The Northern Paiute of Nevada also were oriented towards utilization of the resources of lake and stream. The Snake River Shoshoni and the Northern Paiute shared many material culture traits, and indeed, are virtually indistinguishable archaeologically. The Northern Paiute of Nevada, however, apparently lacked pottery vessels. Shoshoni ware potsherds were not found along the pipeline route south of the East Fork of the Owyhee River. Archaeological data from the pipeline confirms the ethnographic picture of the Owyhee Uplands of southwest Idaho as a marginal area seasonally occupied by food-gathering antelope-hunting family groups. There is also some evidence that the Owyhee Uplands were entered at an early date by peoples known elsewhere in southern Idaho and in the Great Basin. Side-notched points, stemmed, indented base points, medium-sized, concave base, lanceolate points, and Pinto points from the pipeline suggest Altithermal and early Medithermal period incursions into southwest Idaho.

The archaeoloical survey of the Nevada Northern pipeline route and environs helps fill a gap in southwest Idaho and northern Nevada archaeology. A total of 113 archaeological sites and one paleontological locality (Appendix A) were recorded. Three open sites on the right-of-way were tested and found to be shallow sites apparently lacking physical or cultural stratigraphy (Appendix C). Examination of the open pipeline trench, usually a part of pipeline archaeology, was not attempted.

Camp sites, chipping areas, rockshelters, and petroglyph sites were the four types of sites recorded, with some sites falling into more than one category. The 39 open camps occurred in stabilized sand dunes, in sand dunes next to large rivers, at breaks in the rim rock, or erosional breaks in basalt flows, along small intermittent stream courses, along stream terraces, near springs, and occasionally near other features of the terrain. Food preparation tools, more often than not, were found at sites near large rivers and at sites near springs. Chipping areas, 65 in number, were common near small intermittent drainages and near erosional breaks in the rim rock. The 14 rockshelters varied in size from small chambers with room for no more than three or four persons to large ones capable of providing shelter for several family groups. All shelters were found

off the right-of-way. Design elements at all nine petroglyph sites were made by pecking or incising the rock surface. Pictograph sites were not found.

Several kinds of site features were recorded. The nine sites with petroglyphs exhibited design elements executed in Great Basin Curvilinear Abstract, Great Basin Rectilinear Abstract, and Great Basin Scratched Styles. Two sites on mesa tops having semicircular, circular, and oval rock alignments were also recorded. One of these sites has 33 such structures, the other has 20. Both sites are located in Owyhee County, Idaho. Two talus pits and two rock cairns were also found at sites in Idaho. One circular depression, possibly a wickiup floor, was recorded in northern Humboldt County, Nevada. Bedrock mortars were found at two camp sites in Owyhee County, Idaho. Fire hearths were noted at sites in sand dunes near the Snake and Humboldt rivers.

Most of the pipeline surface collection consists of chipped stone artifacts. Projectile points, knives, scrapers, choppers, gravers, drills, cores, and large and small waste flakes make up the collection. Three hundred twenty-six typable projectile points were recovered. These were split into 35 descriptive groups and several sub-groups. Flake points were common at pipeline sites, but these were not classified.

More than 7500 waste flakes were recovered. The percentage of each kind of raw material was calculated for 17 sites from which more than 100 waste flakes were collected. Chalcedony and similar material was more frequently used for stone chipping at pipeline sites in southwest Idaho. Basalt waste flakes were more numerous at sites in northern Elko County, Nevada. Obsidian waste flakes were more common at pipeline sites in Humboldt County and Pershing County, Nevada. Ignimbrite was scarce in the northern Lahontan Basin of Nevada, and black and red banded obsidian from Oregon, not found at pipeline sites in Idaho, comprised a small fraction of obsidian waste flakes from Nevada.

One hundred ninety-one specimens were classified as knives. These were sorted into six main groups and several sub-groups. This tool type apparently was much used by peoples of the northern Great Basin.

Scrapers were also numerous, 423 typable specimens being recovered. These were classified into twelve groups. Bifacial side and end scrapers and utilized thin flakes make up roughly 70% of the collection. Scraper planes were scarce at pipeline sites.

Only 11 choppers or chopping tools were recovered. Flake choppers with a bifacially flaked working edge comprise the most numerous group. Core choppers, pebble choppers, and a single prismatic core chopper make up the balance of chopping tools in the pipeline collection.

Gravers are represented by 23 specimens. They are of two types, one made on plano-convex flakes, and the other showing over-all flaking scars on both faces.

Drills are represented by 18 specimens, all but one from sites in Idaho. The most popular type is a heavy duty drill with a stout bit and a rectangular base.

Ground and pecked stone tools make up less than 5% of the stone artifact collection. Flat slab metates and hand stones or manos, mortars and pestles, shaft smoothers, a tubular stone pipe, and miscellaneous hammer stones, rubbing stones, and edge-battered cobbles are represented. The metate collection consists of eight shaped slab metates and five unshaped slabs. These were made from medium to coarse textured rocks. The 21 manos or hand stones were all small (one-hand) grinding stones. Three sub-types were discerned—oval, sub-rectangular, and tabular. In addition to the previously mentioned bedrock mortars, five portable mortars were noted. A shallow-basin sub-type may represent a hopper mortar. Pestles are of two types, a shaped cylindrical type and an unshaped oval or rectangular type. The three shaft-smoothers are of two types, one with rounded boat or keel shaped ends, the other with squared-off ends. One small tubular stone pipe was recovered at Pe-67 in Pershing County, Nevada. Other ground stone tools collected were miscellaneous hammer stones and polishing stones.

Shell and bone artifacts are not well represented in the pipeline collection. Three spire-lopped *Olivella biplicata* shell beads, type 1a in the Bennyhoff and Heizer (1958) classifica-

tion, were found at open camp sites in sand dunes adjacent to the Humboldt River in Pershing County, Nevada. One mussel shell pendant was recovered from a site in Owyhee County, Idaho. It is triangular in outline. The single bone artifact, possibly a bone die, is a section of a rib with numerous horizontal incisions. It, too, was found at a Pershing County site.

Six pipeline sites yielded potsherds. With one or two exceptions the sherds are parts of Shoshoni ware vessels. A new variety of flanged, flat-bottomed Shoshoni ware pottery was found at one site in southern Owyhee County. This variety of Shoshoni ware is described as Riddle Textile-Impressed. The variety is represented by three vessels, two from the pipeline, and the third in the Nevada State Museum pottery collection. One vessel from the pipeline and the vessel in the Museum's collection show impressions of twined or twill-twined mats on the bottom side of the base. Shallow textile impressions on the base of the third vessel are difficult to discern, but the indentations appear to have been formed by a badly worn coiled tray or basket. Textile impressions on the base of Shoshoni ware vessels have not been described previously.

Post-contact artifacts or artifacts of white manufacture were also recovered at several pipeline sites. Metal objects include a musket barrel bearing the date "1844" on the breech (Appendix B), a brass hinge, two cartridges, several horse or mule shoes, a hand plow, and miscellaneous metal objects. Bottles, buttons, and a single globular blue glass bead make up the balance of post-contact artifacts recovered.

The bulk of the survey information derives from the northern two-thirds of the pipeline route. Comparisons of the findings with other reported data from the area were limited primarily to types of site features and stone tools, particularly diagnostic projectile point types. No new archaeological phases or complexes were defined on the basis of pipeline surface archaeology. Distributions of pipeline projectile point types were seldom discrete, and when they were, the point type in question was usually known from other sites in the region. Thus, the majority of pipeline sites have components equatable with known cultures of southern Idaho and northern and west-central Nevada. In general, the Middle and Late prehistoric periods of southern Idaho, Wilson Butte, IV, V, and VI (Dietrich Phase), and the late phases of northern and west-central Nevada, Wagon Jack, Dune Springs, Amedee, and Late Lovelock, are well represented in the pipeline projectile point collection. Components from some pipeline sites may date back some 5000 years B. C., but the majority of sites are younger, probabaly Medithermal in age, or about 2000 B. C. to A. D. 1850 or 1900. Strong representation of point types dated elsewhere at about A.D. 1 to 1900 is apparent in the pipeline collection.

While some sites, such as small camps and chipping stations, will have been destroyed by construction of the pipeline, others located near, but not on, the right-of-way will be available for future study.

APPENDIX A

VERTEBRATE FOSSILS FROM THE NEVADA NORTHERN PIPELINE

Introduction — By Donald R. Tuohy

Fossil bones were found in northern Owyhee County, Idaho, in an area of low, eroded sedimentary beds situated near a contact zone between a basalt flow and a lake bed. White and buff-colored sedimentary beds of Tertiary age are common in this area, the Payette subsection of the Columbia Plateau.

The fossil bones were found on the slope of a low hill, an erosional remnant of a sedimentary bed about 100 feet in diameter and some 30 feet high. The bones appeared to be concentrated in three areas on the hillside, and therefore three lot numbers were assigned to the separate collections. It seems probable, however, that bones from the separate lots might belong to one individual. All the fragments were part of the desert pavement, and with each storm, some movement of the materials undoubtedly took place.

The three lots of fossils were sent to Professor Marie Hopkins at the Museum of Idaho State College in Pocatello, Idaho. Professor Hopkins agreed to identify the fossils, but found she was hampered by a lack of comparative specimens of Tertiary age and was unable to identify all of them with certainty. Dr. J. R. Macdonald at the Los Angeles County Museum was asked to undertake further study of the specimens, and graciously consented to the request for help.

At the conclusion of her study Professor Hopkins wrote (personal communication, August 10, 1962): "The horse material (I doubt that in the absence of teeth it could be accurately diagnosed to a particular species, possibly not even to genus) is, of the things I recognized, the most valuable indicator as to geologic position . . . I think it probably is in the size range of the Pliocene horse, *Pliohippus*, or some other Pliocene form such as *Hipparion (Neohipparion)* . . . The camelid remains seemingly also *could* have belonged to some Pliocene form, although a Pleistocene form is not necessarily excluded. (See note on one identified by Barbour as Pleistocene) . . . The tooth fragment is too incomplete for a very accurate diagnosis, though some deer-like form such as the three horned Pliocene *Cranioceras* seemed the more likely of my two suggestions."

When Dr. Macdonald had completed his examination, he wrote as follows (personal communication, October 24, 1962): "I have gone over the material and in some cases simply confirmed Miss Hopkins' identification, in some cases disagreed with her, and was able to identify a few she passed over . . . The material with the exception of the "deer" tooth fragment is all horse, camel, and rhinoceros . . . As to age, I'd make a call no closer than late Miocene through early Pliocene. None of the material can be referred to the generic level without a long guess which I'd rather not make."

In summary, the fossils described in the following paragraphs are the remains of extinct species of horse, camelid, deer, and rhinoceros, animals which roamed southwestern Idaho probably some ten million years ago. Long before man appeared on earth, the processes of organic evolution spawned, nurtured, and finally laid to rest these beasts. Through an accident of preservation which turned the bones to stone, we are allowed a fleeting glimpse of life forms of the distant past. By comparison, the temporal range of the stone artifacts described in this report, some 50 to 5000 years, serves only to remind us of the recency of man's emergence among other life forms.

In the following section of this Appendix, Professor Hopkins' identifications are listed first, and Dr. Macdonald's are followed by his initials. Miss Hopkins wishes to acknowledge the help of her assistant, David Fortach, in the identifications made at Idaho State College.

IDENTIFICATION OF VERTEBRATE FOSSILS

By Marie L. Hopkins and J. R. Macdonald

Summer 1962 — Nevada Northern Pipeline fossils found near the confluence of Wickahoney Creek and Jack's Creek in Section 34 of T7S, R4E. The identifications are listed by lots. The ones with asterisks are discussed in the comparative section which follows this list.

Lot I

Deer-like

1. *One fosette of fragment of tooth.
   "Deer tooth." JRM.

Horse-like—comparisions made on the basis of measurements.

*L. 2nd metacarpal—proximal end only.
"Horse. Proximal end of left Mtc. II. Could be either *Neohipparion* or *Hipparion.*" JRM.

2. *Fragment of front of distal end radius-ulna of mature horse-like form.
   "Horse. Distal end of radius ulna." JRM.

Parts of Mammalian bones—identified as to part.

1. Partial head of femur.
   "Horse or camel. Fragment head of femur." JRM.
2. Front of ascending ramus of left dentary of mandible.
   No comment by JRM.
3. Complete distal fibula.
   "Camel. Fibula." JRM.
4. Longitudinal half of astragalus of some artiodactyl.
   "Small camel, astragalus fragment." JRM.
5. Superior lateral fragment of left calcaneum.
   "Camel. Fragment of calcaneum." JRM.
6. Fragment of distal end—possibly metapodial. Camelid?
   "Camel. Lateral (outside right) fragment of distal end of metapodial." JRM.
7. Fragment of carpal or tarsal.
   "Camel? Scaphoid fragment?" JRM.
8. Fragment of carpal or tarsal.
   "Horse. Fragment of navicular." JRM.
9. Fragment of carpal or tarsal.
   "Camel. Fragment of scaphoid." JRM.

Completely unidentified fragments—13 fragments.

1. "Base of astragalus of horse. Articular surface with navicular." JRM.
2. "Fragment of head of femur. Size suggests rhino or proboscidean." JRM.
3. "Fragment of neck and base of head of femur." JRM.
4. "Fragment of head of femur?" JRM.

No comments on other nine fragments by JRM.

Lot II

Horse-like (See + and * on chart).

1. *Phalange II of digit III of horse-like form.
   "Horse. Medial phalanx digit III, *Pliohippus, Neohipparion, Hipparion.*" JRM.

Camelid *Complete distal articular end of proximal phalange of a large Camelid.
"Large Camel. Distal end of proximal phalanx. Large enough to be either *Paracamelus* or *Aepycamelus.*" JRM.

Identified as to parts but not to order or family.

1. Damaged articular surface of distal end of metapodial, (cannot be sure it is a Camelid).
   "Camel. Distal end of metapodial." JRM.
2. Longitudinal fragment probably from the distal end of a metapodial.
   "Distal end of a metapodial of a camel." JRM.
3. Damaged condyloid process region of a left dentary. Should be identifiable.
   "Condyloid of ascending ramus. Won't guess further as much of the articulation is broken away." JRM.
4. Complete carpal or tarsal. Identifiable.
   "Rhino. No comparative material." JRM.
5. Complete carpal or tarsal. Identifiable.
   "Rhino. No comparative material." JRM.
6. Damaged carpal? Or tarsal?
   "Camel. Badly water worn fibula." JRM.
7. Fragment of innominate at acetabulum, I suspect.
   "Glenoid fossa of acapula or acetabulum of innominate." JRM.
8. Less than half of the anterior articular

surface of atlas. Smaller than modern horse, but different.
"Part of the anterior end of atlas, probably horse." JRM.

Fragments not identifiable, 15 fragments.

1. "Camel? Distal end of metapodial?" JRM.
2. "Fragment head of femur?" JRM.
3. "Camel. Distal end of astragalus." JRM.
4. "Fragment of glenoid fossa of scapula or acetabulum of innominate." JRM.

No comments on other eleven fragments.

Lot III

Horse-like.

1. *Proximal Phalange I of digit III of horse-like form.
"Horse. Proximal phalanx." JRM.
2. *Phalange II of digit III of horse-like form. Seems to fit phalange I above.
"Horse. Median phalange of digit III." JRM.
3. Damaged proximal end of phalange I. Probably too asymmetrical to be from digit III of horse.
"Horse. Proximal end of proximal phalanx III." JRM.
4. *Fairly complete left astragalus from hind leg of horse-like form.
"Large horse. Astragalus." JRM.
5. *Right scaphoid of front leg carpal region of horse-like form.
"Horse. Scaphoid." JRM.
6. Damaged astragalus of horse-like form—young?
"Horse. Astragalus." JRM.
7. Fragment of astragalus of horse-like form.
"Horse. Astragalus." JRM.
8. Partial astragalus of horse-like form.
"Horse. Part of astragalus." JRM.
9. Fragment of astragalus of horse-like form.
"Horse. Astragalus." JRM.
10. Portion of distal articular surface of left tibia. (Somewhat smaller animal than one the measured astragalus was from).
"Horse. Distal end of tibia." JRM.
11. Odontoid process and adjacent anterior articular surface of an axis, not exactly like Pleistocene and Recent horses.
"Horse. Odontoid process of axis." JRM.
12. Portion of right inferior articular surface of atlas; horse-like, as far as it can be compared.
"Possibly horse. Fragment of an atlas." JRM.
13. Somewhat horse-like fragment of patella, not exactly like Pleistocene and Recent horses.
"Horse. Patella." JRM.

Camelid

1. *Damaged half of distal end of metapodial of a Camelid.
"Large camel. Distal end of metapodial." JRM.
2. Either part of glenoid fossa somewhat like that of a large Camelid scapula, or piece of innominate and acetabulum of an animal I am unable to identify.
"Glenoid fossa of scapula or acetabulum of innominate." JRM.
3. One superior articular facet and adjacent portion of left calcaneum—somewhat like Camelid.
"Camel. Fragment of calcaneum." JRM.
4. A somewhat Camelid-like damaged fragment of proximal end of semilunar notch of radius-ulna.
"Fragment of proximal end of ulna with portion of semilunar notch. Possibly camel." JRM.

Incompletely identified material—probably identifiable.

1. Slightly damaged carpal or tarsal—rather large.
"Rhino. No comparative material." JRM.
2. Partial carpal or tarsal.
"Camel. Navicular." JRM.
3. Partial carpal or tarsal.
"Camel. Lunar." JRM.
4. Partial carpal or tarsal.
"Camel, Magnum." JRM.
5. Partial carpal or tarsal.
"Camel. Cuboid." JRM.
6. Partial carpal or tarsal.
"Camel. Scaphoid." JRM.
7. Partial carpal or tarsal.
"Camel. Ectocuneiform." JRM.
8. Partial carpal or tarsal.
"Camel. Fragment of unciform or magnum." JRM.
9. Either a partial glenoid fossa region of

scapula or acetabular fragment and adjacent ramus of pelvis.

"Fossa of scapula or acetabulum of innominate." JRM.

Completely unidentified fragments, 17 fragments.

1. "Fragment head of femur, immature individual." JRM.
2. "Rhino. No comparative material." JRM.
3. "Fragment of glenoid fossa of scapula or acetabulum of innominate." JRM.
4. "Fragment of head of femur." JRM.
5. "Fragment of head of femur." JRM.

COMPARISONS

by

Marie L. Hopkins

Horse-like (includes besides horses the Hipparions—latter are all 3 toed).

1. **L. second metacarpal** (Splint of left foreleg). Proximal end only (Lot I). This bone is at least 1/3 smaller than *Plesippus shoshonensis* from Hagerman, Idaho. Hagerman horse quarry was originally thought to be upper Pliocene—now thought to be earliest part of Pleistocene.

   *This bone is practically the same size as *Hipparion (neohipparion) leptode* Merriam U.C.M.P. #27196 from Thousand Creek Pliocene of Nevada, judging from the scale figures of it I measured in the Merriam and Stock article in "Carnegie Institution Contributions to Paleontology" Publ. 393, p. 22, Plate I, Figs. 1, 2, and 5. A. B. Drescher (1941) in "Carnegie Institution Contributions to Paleontology", Publ. 530, p. 10 considers Thousand Creek Middle Pliocene.
2. **Right scaphoid** (Lot III). Right front Carpal Region — some minor differences as compared with one we have which we think belongs to early history mule. (See table below)
3. **Fairly Complete l. astragalus** (Lot III) from hind leg of a horse-like form. At least 1/3 smaller than *Plesippus shoshonensis* from Hagerman (Early Pleistocene).

   Longer and less wide across trochlea than *Hypohippus* of Ricardo (lower Pliocene) of Mojave Desert, California. See Published Papers of J. C. Merriam, Vol. II, p. 1154.
   Smaller than *Hypohippus* sp. Miocene—See "Carnegie Institution Contributions to Paleontology", Publ. 514, p. 136.

   Larger than *Merychippus isonensis* (Cope) from Miocene of Skull Springs, S. E. Oregon.

   See "Carnegie Institution Contributions to Paleontology", Publ. 418, p. 79.

   Practically the size as one J. C. Merriam said was some **Hipparion** or **Pliohippus** sp. from Ricardo region S. California. See Published Papers of J. C. Merriam, Vol. II, fig. 208, p. 1256.

   The Ricardo is lower Pliocene according to A. B. Drescher (1941) p. 10 in "Carnegie Institution Contributions to Paleontology", Publ. 530.
4. **Tooth fragment** (Lot 1)—One fossette only (of upper milk tooth, *if* it is horse, Deciduous Premolars DPM). The absence of cement inside the fossette makes me doubt it is horse. However, I noted that in several modern mustang upper skulls which Dr. Larry Richards donated to the Museum, some of the fossettes have practically no cement in them, so possibly the absence wouldn't prevent it being horse. A slight cingulum, a more deer-like feature was noted. It might, more probably, instead of horse DPM, be the fossette out of upper 4th permanent premolar of a deer-like form with a 3rd or occipital horn—*Cranioceras*—limited to the late Tertiary. See Chart below how size of fossette compares with *Pliohippus* milk tooth and *Cranioceras* P4.

	Pipeline Specimen	Mod. Early History Mule (ISC Museum)
Greatest Diameter	*32.15 mm	45.9
Greatest Measurement at right angles to longest diameter	25.9 mm	33.85
Greatest Height	25.1 mm	31.15

TABLE 1

Pipeline Tooth Fragment

	Pipeline Tooth Fragment	**Pliohippus** U. of Calif. at Berkeley No. 22392 Upper Deciduous tooth from Rattlesnake Pliocene of Oregon. Merriam Vol. I, Publ. Pap. p. 636 Fig. 28-C Posterior Fossette		Frick Collection Amer. Museum 32066-Fig. 12-**P4** of **Cranioceras**. See p. 78 of Childs Frick "Horned Ruminants, Bull. Amer. Mus. Nat. Hist." Vol LXIX (Appears in Fig. 12 to lack cement in fossette)
Anterior-Posterior length of fossette thru center of occlusal surface	12 mm	11.6 mm	(Figure 28C (appears to	11.57 mm
Greatest transverse width of fossette	7 mm	7.65 mm	(have cement (in fossette. (See comment (above.	6.1 mm
Height of Crown Proper	8 mm	17.2 mm	but younger	—

TABLE 2

Phalanx I — Digit III — Lot III

	Complete Pipeline Specimen	Est. from Fig. 195-P. 1253 J. C. Merriam, Publ. Papers Vol. II "Close to **Pliohippus pernix**" Ricardo-Southern Calif. Lower Pliocene	From Gazin, C. L. "Late Cenozoic. Vertebrate Faunas from San Pedro Valley, Ariz." (pp. 494, 495, 481, 482) From Benson Ranch Ariz.-**Blancan Nanippus phlegon** (Synonym of **E. minutus** (Cope) & **Hipparion phlegon**) 3-toed **Hipparion**-like.	U. of Cal. — Berkeley #27126 **Hipparion (Neohipparion) leptode** Thousand Creek, Nevada (Middle Pliocene) "Carnegie Inst. Cont. to Paleo.," Publ. 393, p. 16.
Approximate overall length	60.7 mm	63.5	51	67
Approximate width of proximal end damaged	36+, slightly	35	23.5	38
Approximate width (transverse of distal end)	35.25 mm	32	20.0	——
Least transverse width of shaft	23 mm	19.04	—	——

Nanippus lasted into the Pleistocene, was 3 toed, small, and with extremely slender limbs and feet.

TABLE 3

Phalanx II of Digit III — Lot III

	Complete Pipeline Specimen		**Hipparion?** U. of Calif. #21197, Berkeley, Fig. 196, 197, P. 1253 Merriam, Publ. Papers, Vol. II Ricardo Pliocene, Mohave Desert, California		**Hipparion (Neohipparion) leptode,** U. of Calif. at Berkeley #27126 from Thousand Creek, Nevada, Middle Pliocene—See "Carnegie Institution Cont. to Paleo.," Publ. 393, p. 16.
	Lot 2	Lot 3	Fig. 196	Fig. 197	
Approximate Overall Length	*35.9	+38.4	30.6	29.6	38.7
Approximate Width, Proximal end	*32.4	+35.6	32.4	29.6	37.4

5. **Fragment of front of distal end of radius-ulna of a mature member of Family Equidae —Pipeline—Lot I.**
   In two comparable measurements, it is almost 1/3 smaller than *Plesippus shoshonensis* from Haggerman, Idaho. In two other measurements, it is 1/4 and 1/5 smaller than *Plesippus shoshonensis* from Haggerman—material on *Plesippus* in Idaho State College Museum. Since bones from separate lots might belong to the same individual animal, the size of this mature radius-ulna should be checked against that of *Pliohippus* and *Hipparion (Neohipparion)* of the Pliocene. I was unable to find any measurements for the radius-ulna of either of these forms in the literature available to me.

Camelids

1. ***Damaged 1/2 of distal end of Camelid metapodial. Lot III.**
   Greatest transverse width approximately 41.5 mm. Compares favorably with measurements of 43.2 mm for *Pliauchenia* sp. A-Fig. 72a from Eden Beds—lower Pliocene. See Childs Frick, Extinct Vertebrate Fauna of the Badlands of Bautista Creek and San Timotea Canon, Southern California, in "University of California, Publ. Bull. of Dept. of Geology", Vol. 12, p. 365.
2. ***Damaged distal end of proximal phalange of Camelid with distal articular surface almost complete. Lot II.**
   Greatest width of distal articular surface, approximately 41mm., is within range of *Pliauchenia* from the Eden Beds — Lower Pliocene of Southern California. See Childs Frick in "University of California Publ. Bull. of Dept. of Geology", Vol. 12, p. 365, Fig. 72. Its greatest distal width is, however, about the same as one Pleistocene Camelid referred to *Titanotylopus nebraskensis* by Barbour 1934 — See "Bulletin 36, Nebraska State Museum", Vol. I, p. 294.
   Its greatest distal width is not quite as large as Meade gives for *Gigantocamelus spatula* of the Blancan fauna of Texas, in "University of Texas Publication", No. 4401. In that article the range of this measurement in *Gigantocamelus* spatula is from 41mm. to 52 mm.

APPENDIX B

IDENTIFICATION OF A 19th CENTURY MUSKET

H. J. Swinney, Director, Idaho Historical Society, Boise, Idaho

Mr. Donald Tuohy, Assistant Archaeologist of the Nevada State Museum, has submitted a fragment of a musket barrel to me for identification. I render herewith the following report.

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1. Physical Description: The object is a gun barrel approximately 28" long, containing the remains of a breechplug whose tang has been broken off short, but retaining no other gun parts. The existence of a flashhole on the right side demonstrates it to be from a flintlock gun. The barrel is approximately 1.350" in diameter at the largest point near the breech, and approximately .888" in diameter a quarter inch back from the present muzzle. The present muzzle is not square, and has been severely battered; the remainder of the barrel is very deeply rusted and pitted all over. It is not possible to measure the original bore, due to the servere "flanging" of the interior of the muzzle resulting from the battering it has received, but the largest measurement which can be obtained is approximately .650".

A tag tied to the muzzle bore the notation "Nev. Northern Site 3466, Owyhee County, Idaho, D. T. and R. B., 6-13-62". A Nevada State Museum artifact record was also attached with the same information, adding that this had been found in the Nevada Northern Pipeline Camp Area below Lost Valley, and assigning it field No. 30.

2. Examination and Treatment: Upon visual examination in a strong light, a date was seen on the top of the remains of the breechplug. The top rear surface of the barrel was brushed by hand with a wire brush and then oiled with No. 10 motor oil to produce a more reflective surface. The date emerged clearly as 1844. The upper left quadrant of the breech of the barrel

was then smoothed and polished with No. 0 emery cloth in order to remove as far as possible the very extensive and deep surface accumulation of rust. No decipherable marks emerged; however, the surface is so severely corroded that it is quite possible that any original marks have vanished.

3. Identification: The barrel shape, which is typical of an American military musket, and the date 1844 on the tang lead to the tentative conclusion that this is the remains of a U. S. regulation infantry musket, Model of 1835.

This was originally .69 caliber; the specimen submitted is at least approximately that caliber in spite of the difficulty in getting an exact bore measurement. To support this conclusion, the barrel should have been compared for size with a Model of 1835, but none could be located. Therefore, a comparison was made with a good example of a Model 1816, owned by the Idaho Historical Society. There was very little change between these models, which were successive. Measurements were made with a vernier caliper reading in thousandths of an inch. (See table below)

On the upper left quadrant of the rear of the barrel one would expect to find the capital letters "V" and "P" stamped over an eagle's head, these being "proof" or acceptance marks of the government inspection. These marks do not appear on the present specimen. Either they have been entirely corroded away — a strong possibility — or else they were never there to start with. If the latter, it may be that this barrel came from a gun which was made up by one of the contractors out of leftover or rejected parts, and which was sold on the civilian market or to the Indian trade and thus never was subjected to government inspection and approval. However, there are enough suspicious marks remaining among the rust pits in the appropriate place to make me think that the inspector's marks were originally affixed to this barrel.

In spite of the lack of proof marks, the close correlation in size with a Model 1816 barrel, well inside the normal variation in such arms, is strong evidence. A comparison should be made with an actual specimen of the U. S. Model 1835, but there can be little doubt about the identification: The specimen submitted was originally 42" long and was the barrel for the U. S. regulation military musket, Model of 1835.

4. Background: The Model of 1835 musket is assigned that nomenclature because its manufacture was approved in that year. However, actual manufacture did not begin until late in 1839. Springfield Armory terminated manufacture of this model on September 30, 1844, and it is possible (considering the date on the tang) that the present specimen was among the last manufactured at the Armory. However, contracts for muskets of this model were let to four private firms: Edwards & Goodrich of New Haven, Connecticut; Daniel Nippes of Mill Creek, Pennsylvania; Lemuel Pomeroy of Pittsfield, Massachusetts; and Tryon, Son & Company of Philadelphia, Pennsylvania. Tyron produced this model only in the year 1846, but the other three contractors were all in production during the year 1844.

This was the last regulation flintlock smoothbore musket to be produced for the U. S. military service. In 1842, the development of a percussion design was directed by the Ordnance Department, and that design went into production in 1844.

Of the total of 30,421 of this model produced at Springfield Armory, 26,841 were converted to percussion at the Armory between 1849 and 1851. In addition, some hundreds were experimentally rifled in 1842. Of a total of 5,600 flintlock Model 1835 muskets manufactured by Nippes, at least 2,000 were converted by him to percussion under subsequent contracts. However, Edwards & Goodrich produced 7,500 and Pomeroy produced 7,000 of this model which may or may not have been converted. It is nevertheless a little surprising to find this barrel in original flintlock form.

5. Observation: It is curious that the breechplug tang has been completely broken off, and that the fractured area has been severely bat-

	1816 Model	Nevada Specimen
Width of barrel tang	.558"	.580"
Diameter of barrel at breech	1.292"	1.250"
Diameter of barrel at lower band	1.005"	1.009"

tered. Because of this and because of the severe battering of the muzzle, I suspect that this gun barrel was probably used as a crow bar or prybar in the last period of its existence, rather than as a gun itself. It can hardly have been fired with the muzzle in its present condition. Furthermore, the barrel itself is considerably bent, and there is a very deep gouge in its metal about 4'' from the breech. This may have been the place where it lay on a fulcrum while being used as a lever.

There is one additional note. There is an obstruction in the barrel approximately 3 1/2" forward of the breech. It feels quite solid, and it may be that the barrel is still loaded after all these years. (Note: The obstruction was later removed; it was not a charge. D.R.T.).

6. Summary: This specimen is identified as the fragmentary remains of the barrel of a regulation U. S. infantry flintlock of the Model of 1835. This example was manufactured in 1844. A relatively small number of muskets of this model seems to have been issued to troops in the original flintlock form, so that it seems reasonable to guess that it may have reached the place where it was found in the hands of someone other than a regular infantryman of the U. S. Army.

7. Bibliography: Discussion of this model will be found in the two standard works listed below, Hicks having the better illustrations, and Gluckman the more detailed and explicit text.

Gluckman, Arcadi

1948 *United States Muskets, Rifles and Carbines.* Otto Ulbrich Company, Incorporated. Buffalo.

Hicks, James E.

1946 *Notes on United States Ordnance, Volume I, Small Arms, 1776 to 1946.* Published by the Author. Mount Vernon, New York.

APPENDIX C

TEST EXCAVATIONS

By Donald R. Tuohy

As the survey of the pipeline route was carried out well ahead of construction activity, time was available to salvage or to excavate any site found on the route. Only three sites appeared promising enough to merit test excavations, the first being 10-El-53, a small rockshelter north of U. S. Highway 30 in Elmore County, Idaho; the second, 10-El-56, a camp site in stabilized sand dunes along the north bank of the Snake River, also in Elmore County; and last, 10-Oe-145, a camp site along a small intermittent drainage in Owyhee County, Idaho. All three sites were tested and were found to be rather shallow, with no discernable horizontal or vertical stratigraphy. Because of these negative test results, complete salvage excavations were not attempted. A description of the several tests follows.

The rockshelter, 10-El-53, is a u-shaped break in the basalt rim rock overlooking a small cheat-grass and sagebrush covered valley (Pl. 4, *a*). The sheltered area is about 30 feet wide across the face of the outcropping, and some 10 feet deep, from the lip of the talus slope to the rear wall. The overhang is very slight, not more than a foot of the deposit being covered by the roof. Ignimbrite waste flakes and a small, side-notched point were found on the floor of the shelter. Ignimbrite waste flakes were also found on the top of the basalt outcropping which formed the walls of the shelter. One test unit was staked out near the western wall, an area in danger of destruction by blasting for the pipeline trench. The unit, originally five feet square, was enlarged to a five by eight foot rectangle. The test was conducted with trowels and shovels, and all backdirt was passed through a quarter inch screen. At a depth of ten inches, bedrock was encountered, and the test was discontinued. A second small side-notched point, and a few small mammal bones were recovered from the test area.

The second site tested, 10-El-56, a rather extensive camp along the north bank of the

Snake River, had been partially destroyed (Pl. 2, *a)*. From the bulldozed cuts still in evidence, it was estimated that the site originally was two to three feet higher than present ground surface. Portions of the stabilized dunes east of the proposed right-of-way had been stripped away for fill dirt. Along the proposed center line of the pipe, numerous fragments of river mussel shell and a few waste flakes from stone chipping were collected. Immediately east of the center line, a remnant of the original ground surface appeared undisturbed, and a small collection of projectile points, a pestle fragment, some Shoshoni ware potsherds and other artifacts were collected from the bulldozed bank.

Three test units, each five feet square, were staked out along the center line. Two of these were excavated, and the backdirt was passed through a quarter inch screen. At a depth of an inch or two, a layer of light-tan sandy loam, obviously not midden, was encountered. The tests were discontinued after depths of 6 and 16 inches, respectively, were attained in the test units.

The proposed right-of-way was then reexamined. Thirty feet east of the right-of-way, on an access road which crosses the site area and leads to an irrigation siphon, there was found a fire hearth, an area of dark brown and black earth containing much charcoal. Designated as feature 1 (Pl. 7, *b)*, it was more or less oval in plan, being about 7 feet long and 3 feet wide. The area around the hearth was cleared with a trowel, and the hearth was then excavated as a unit to a depth of 12 inches. Again, all back dirt was passed through a quarter inch screen. Several artifacts were found in association with the hearth. A broken mortar lay near the southern margin of the feature. Next to the mortar, a portion of an edge-ground river cobble was found. Recovered from the screen, but associated with the feature, were the following: a projectile point tip, a stemmed lanceolate point with serrated edges and a concave base, fragments of large and small mammal bones, river mussel shells, broken pebbles, and a few waste flakes.

The next area tested at site El-56 was a remnant of the original stabilized dune surface about 125 feet east of station 864 (Fig. 4). A northwest-southeast oriented trench, 20 feet long and 5 feet wide, was staked out. Only one five foot square was excavated. It contained a few fire-cracked pebble fragments, mussel shell fragments, and a few waste flakes in the upper level, but no finished artifacts. At a depth of about 8 inches the sterile, compact, light-tan sandy loam was reached, and the test was discontinued.

Two other five foot square units were also excavated in this area. Although the upper level, or culture bearing deposit, was thicker in these units, ranging up to a foot in thickness, the cultural yield was low, and sterile sandy loam was encountered just below the midden deposit. No other areas of this site were tested, although it was felt than an examination of the open pipeline trench might be worthwhile.

The third site meriting a test was 10-Oe-145, a large camp along an intermittent drainage in Owyhee County, Idaho (Pl. 2, *b)*. A rather large collection of surface artifacts had been made at this site, and it was decided that a test would be desirable. A four foot square test unit was staked out along the center line of the pipe which passes diagonally through the site area. This unit was excavated to a depth of ten inches. A few fragments of charred mammal bone and a few waste flakes were recovered in the unit before sterile soil was reached. The test was then discontinued, and no further testing was attempted elsewhere. It is now believed that further tests should be carried out at this site, and this will be possible in the future because much of the site area will be left undisturbed by construction.

In summary, the test excavations conducted at three sites along the pipeline route were largely unproductive, only demonstrating the superficial nature of most open sites in the region.

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EXPLANATION OF PLATES

Plate 1. Several views showing the types of terrain and archaeological sites found along the Nevada Northern right-of-way. *a,* Blue Creek Valley, Owyhee County, Idaho. 10-Oe-143, a chipping station at a break in the rim rock; the site extends down the talus slope below the basalt outcropping in the foreground; *b,* The Canyon of the South Fork of the Owyhee River; several rockshelters were recorded in this canyon; *c,* 26-Hu-17, a chipping area and a camp on a terrace above the North Fork of the Little Humboldt River, occupies the rounded hill in the middle distance; *d,* 26-Hu-39, a camp located on terraces of the North Fork of the Little Humboldt River.

Plate 2. Types of terrain and archaeological sites. *a,* 10-El-62, a large camp site located in stabilized dunes adjacent to the Snake River. Test area "A" is staked out in the foreground; *b,* 10-Oe-145, a camp site located along a small intermittent drainage and near natural springs; *c,* 10-Oe-138, a paleontological locality. The fossil vertebrate specimens (Appendix A), were collected near the low hill at top left; *d,* 26-Pe-79, a camp site, extends along the strand line near the top of the ridge in the background.

Plate 3. Types of terrain and historic sites. *a,* 26-Pe-67, a camp site in stabilized dunes adjacent to the North Fork of the Humboldt River; *b,* 26-Pe-81, a chipping station, was found around the edge of the playa shown in this plate; *c,* Ruins of a Wells Fargo Stage Station near Imlay, Nevada; *d,* Road to Buckskin Mill near Paradise Valley, Nevada. The mining road was constructed by Chinese laborers during the gold rush days.

Plate 4. Caves and rockshelters found near the Nevada Northern right-of-way. *a,* A small rockshelter, 10-El-53, which was partially excavated; *b,* 26-Elko-32, a rockshelter in the canyon of the South Fork of the Owyhee River; *c,* 26-Hu-40, a rockshelter located on a hillside near Paradise Valley, Nevada; *d,* 26-Hu-45, another rockshelter located near Paradise Valley, Nevada.

Plate 5. Butte-top site with rock alignments, 10-Oe-169. *a,* View of the butte and connecting saddle to the right; *b,* Circular rock alignment on top of butte; *c,* Oval rock alignment on top of butte; *d,* Oval rock alignment on top of butte.

Plate 6. Butte-top site with rock alignments, 10-Oe-171. *a,* View of the butte showing the connecting saddle in the foreground; *b,* Circular rock alignment on top of butte. This structure overlooks the canyon of Battle Creek; *c,* Oval rock alignment on top of butte; *d,* Large oval rock alignment on top of butte.

Plate 7. Features recorded at several pipeline sites. *a,* A rock cairn at 10-Oe-145; b, Feature 1, a fire hearth area at 10-El-56; *c,* A house pit or wickiup floor at 26-Hu-21; *d,* A talus pit at 10-El-53.

Plate 8. Features recorded at several pipeline sites. *a,* Two bedrock mortars at 10-Oe-167; *b,* Another bedrock mortar at 10-Oe-167; *c,* A bedrock mortar at 10-Oe-145; *d,* Obsidian nodules and waste flakes from stone chipping at a typical chipping station, 26-Hu-34.

Plate 9. The Hamlin-Pasquale Petroglyph Site, 26-Hu-43. *a,* General view of the site area. The petroglyphs occur on the rock out-croppings in the middle distance; *b,* Schist outcropping at 26-Hu-43 bearing numerous petroglyphs; *c,* Petroglyph panels at 26-Hu-43; *d,* Close-up view of petroglyph panel at 26-Hu-43. This plate is partially obscured by a light streak as are several of the other photographs of the petroglyphs.

Plate 10. Design elements on panels of schist, 26-Hu-43, the Hamlin-Pasquale Petroglyph Site. *a,* Another view of elements shown in Pl. 9, *c, d; b,* Petroglyph panel at 26-Hu-43 showing superimposition of "Scratched Style" design elements upon "Great Basin Curvilinear Abstract" designs; *c,* Design elements partially obscured by light reflecting into camera. This group of designs includes horse shoe and zig-zag elements which show more clearly in Pl. 9, *c; d,* Close-up view of a petroglyph panel clearly showing how the design elements were pecked into the schist.

Plate 11. Extensive petroglyph panels at 26-Hu-43, the Hamlin-Pasquale Petroglyph Site. *a, b,* Two views of a large panel exhibiting "cur-

vilinear meanders", and other design elements; *c*, Petroglyph panel showing superimposition of "Scratched Style" design elements upon "Great Basin Curvilinear Abstract" designs. Note too, the fresh appearance of the circle and tailed circle at the far right; *d*, Top of schist block exhibiting numerous design elements.

Plate 12. Miscellaneous design elements at 26-Hu-43, the Hamlin Pasquale Petroglyph Site. *a*, *b*, Curvilinear meanders and connected circles; *c*, Anthropomorphic figure executed in the "Scratched Style". Note the superimposition of the figure upon pecked design elements. This figure also shows in Plate 10, *b*; *d*, Older and younger design elements on panel shown in Plate 11, *c*.

Plate 13. Miscellaneous design elements at 26-Hu-43, the Hamlin-Pasquale Petroglyph Site. *a*, Note the bird-like design at the extreme right; *b*, A rake and a bissected circle; *c*, A sunburst, a circle, and a compound figure; *d*, A close-up view of the latter figure.

Plate 14. Petroglyph panels of basalt rock at 26-Hu-42, the Chabot-Short-McAuliffe Petroglyph Site. *a*, General view of area showing the basalt outcropping which bears the petroglyphs; *b*, One of the larger and better preserved basalt blocks; *c*, *d*, Two views of basalt blocks bearing petroglyphs at 26-Hu-42.

Plate 15. Circular design elements at 26-Hu-42. *a*, Circle bissected by a spear; *b*, Sectioned circle (?); *c*, *d*, Cluster of circles and a bissected circle.

Plate 16. Petroglyph panels at 26-Hu-42, the the Chabot-Short-McAuliffe Petroglyph Site. *a*, A large insect-like figure; *b*, Badly weathered design elements; *c*, Sectioned circle with three tails, a shield (?); *d*, A close-up view of the sunburst figure at Hu-43, the Hamlin-Pasquale Petroglyph Site. This figure is also shown in Plate 13, *c*.

Plate 17. Petroglyphs at 10-Oe-163. *a*, Basalt outcropping which bears the petroglyphs; *b*, *c*, *d*, Three views of the several panels which exhibit petroglyphs.

Plate 18. Petroglyphs at 10-Oe-169 and 10-Oe-170. *a*, Talus boulder of basalt which exhibits petroglyphs (10-Oe-170); *b*, Close-up view of the boulder showing the several design elements; *c*, *d*, Petroglyphs at 10-Oe-169. The design elements present are dots and paws with circular toes.

Plate 19. Petroglyphs at 10-Oe-146. *a*, General view of the basalt cliff bearing the petroglyphs; *b*, A headless human figure; *c*, S-shaped meander; *d*, A bissected oval with a tail.

Plate 20. Petroglyphs at 10-Oe-168. *a*, A group of design elements at the site; *b*, A rake, a figure eight, and a circle; *c*, A large snake design on a talus boulder; *d*, Dots and a cross.

Plate 21. Petroglyphs at several sites. *a*, General view of rock outcropping and adjacent pool at 10-Oe-156; *b*, Pair of connected circles forming the only petroglyph found at 10-Oe-156; *c*, Ladder or grid and other design elements at 26-Hu-43, the Hamlin-Pasquale Petroglyph Site; *d*, An incompletely closed figure eight design element at 10-Oe-168.

Plate 22. Projectile point types and subtypes. *a*, Type 1; *b*, Sub-type 1a; c, Sub-type 1b; *d*, Sub-type 1c; *e*, Type 2; *f*, Sub-type 2a; *g*, Sub-type 2b; *h*, Type 3; *i*, Sub-type 3a; *j*, Sub-type 3b; k, Sub-type 3c; *l*, Type 4; *m*, Sub-type 4a; *n*, Sub-type 4b; *o*, Sub-type 4c; *p*, Sub-type 4d; *q*, Sub-type 4e; *r*, Sub-type 4f; *s*, Sub-type 4g; *t*, Sub-type 4h; *u*, Type 5; *v*, Type 6; w, Type 7; *x*, Type 8; *y*, Type 9; *z*, Sub-type 9a; *aa*, Sub-type 9b; *bb*, Type 10; *cc*, Type 11; dd, Type 12; *ee*, Type 13; *ff*, Sub-type 13a; *gg*, Type 14; *hh*, Sub-type 14a; *ii*, Sub-type 14b; *jj*, Sub-type 14c. Sub-type 11a is not illustrated.

Plate 23. Projectile point types and subtypes. *a*, Type 15; *b*, Sub-type 15a; *c*, Type 16; *d*, Type 17; *e*, Sub-type 17a; *f*, Sub-type 17b; *g*, Sub-type 17c; *h*, Type 18; *i*, Sub-type 18a; *j*, Type 19; *k*, Type 20; *l*, Type 21; *m*, Sub-type 21a; *n*, Sub-type 21b; *o*, Sub-type 21c; *p*, Sub-type 21d; *q*, Sub-type 21e; *r*, Type 22; *s*, Sub-type 22a; *t*, Type 23; *u*, Sub-type 23a; *v*, Sub-type 23b; *w*, Sub-type 23c; *x*, Type 24; *y*, Sub-type 24a; *z*, Sub-type 24b; *aa*, Type 25; *bb*, Type 26; *cc*, Type 27; *dd*, Type 28; *ee*, Type 29; *ff*, Sub-type 29a; *gg*, Type 30; *hh*, Sub-type 30a; *ii*, Sub-type 30b; *jj*, Sub-type 30c; *kk*, Type 31; *ll*, Sub-type 31a; *mm*, Sub-type 31b; *nn* Type 32.

Plate 24. Projectile point types and subtypes, knives, gravers, drills, and flake points. *a*, Sub-type 32a; *b*, Sub-type 32b; *c*, Type 33;

d, Type 34; *e*, Sub-type 34a; *f*, Type 35; *g*, Sub-type 35a; *h*, Sub-type 35b; *i*, Sub-type 35c; *j*, *k*, Knife type 6; *l*, *m*, Graver type 1; *n*, *o*, Graver type 2; *p*, *q*, *r*, Drill type 1; *s*, *t*, Drill type 2; *u*, Drill type 3; *v*, Drill type 4; *w*, *x*, *y*, *z*, *aa*, *bb*, *cc*, *dd*, *ee*, *ff*, *gg*, *hh*, *ii*, *jj*, *kk*, Flake points.

Plate 25. Knife types, a scraper or saw, and a large basalt flake from several pipeline sites. *a*, Knife type 1; *b*, Knife type 2; *c*, Knife type 2a; *d*, Knife type 2b; *e*, Knife type 3; *f*, Knife type 3a; *g*, Knife type 4; *h*, Knife type 4a; *i*, Knife type 5; *j*, Knife type 5a; *k*, Scraper type 12; *l*, Basalt flake. Knife type 6 is shown in Plate 24, *j*, *k*. Scraper type 12 might have been classified as a saw or knife.

Plate 26. Scraper types from the pipeline survey. *a*, *b*, Scraper type 1; *c*, *d*, Scraper type 2; *e*, *f*, Scraper type 3; *g*, *h*, Scraper type 4; *i*, *j*, Scraper type 5; *k*, *l*, Scraper type 6; *m*, *n*, Scraper type 7; *o*, *p*, Scraper type 8; *q*, *r*, Scraper type 9; *s*, Scraper type 10; *t*, Scraper type 11. Scraper type 12 is shown in Plate 25, *k*.

Plate 27. Chopper types from several pipeline sites. *a*, Chopper type 1; *b*, Chopper type 2; *c*, Chopper type 3; *d*, Chopper type 4.

Plate 28. Ground and pecked stone artifacts from several pipeline sites. *a*, Boat-shaped shaft smoother from 10-Oe-145; *b*, Rectangular shaft smoother, also from 10-Oe-145; *c*, Boat-shaped shaft smoother from 26-Pe-67; d, Tubular stone pipe fragment from 26-Pe-68; *e*, Abraded quartz crystal from 26-Pe-78; *f*, Quartzite smoothing or polishing stone from 10-Oe-172; *g*, Rubbing or polishing stone from 26-Pe-79; *h*, Edge-battered cobble from 10-Oe-166; *i*, Pebble hammer stone from 10-El-62.

Plate 29. Pestle types from several pipeline sites. *a*, Shaped cylindrical type; *b*, Unshaped rectangular type; c, Unshaped oval or cylindrical type; *d*, Shaped oval or cylindrical type.

Plate 30. Shaped slab metates and a portable mortar. *a*, A shaped slab metate from 10-El-58; *b*, Another metate of the same type from 10-Oe-145; *c*, Shallow-basin portable mortar from 10-El-62.

Plate 31. Manos or hand stones from several pipeline sites. *a*, Oval biface sub-type; *b*, Tabular biface sub-type; *c*, Sub-rectangular biface sub-type; *d*, Oval uniface sub-type; *e*, Tabular uniface sub-type; *f*, Sub-rectangular uniface sub-type.

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Map 3. Archaeological sites on and near the Nevada Northern pipeline route, Elko County and Humboldt County, Nevada.

Map 4. Archaeological sites on and near the Nevada Northern pipeline route, Humboldt County and Pershing County, Nevada.

Map 5. Archaeological sites on and near the Nevada Northern pipeline route, Pershing County, Churchill County, and Washoe County, Nevada.

PLATE 1

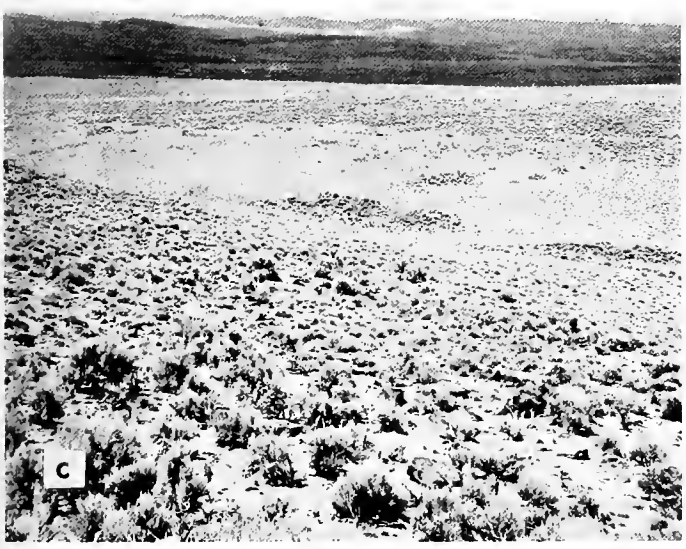
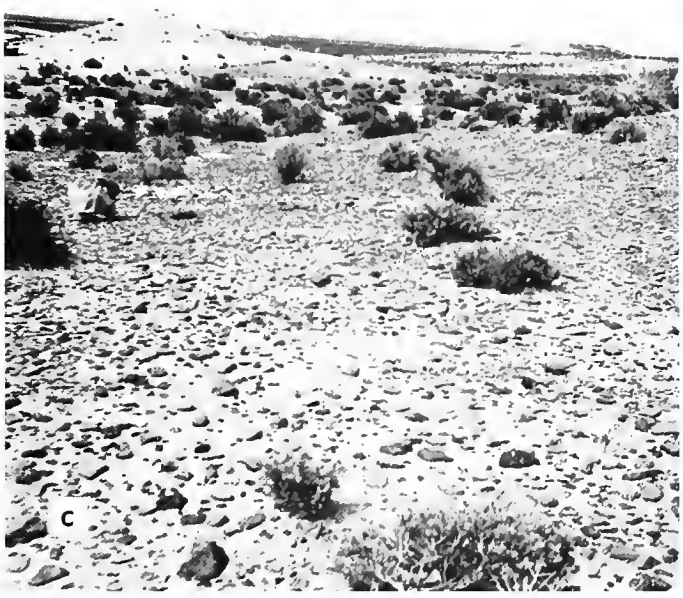


PLATE 2


a


b


c


d

PLATE 3


a


b


c

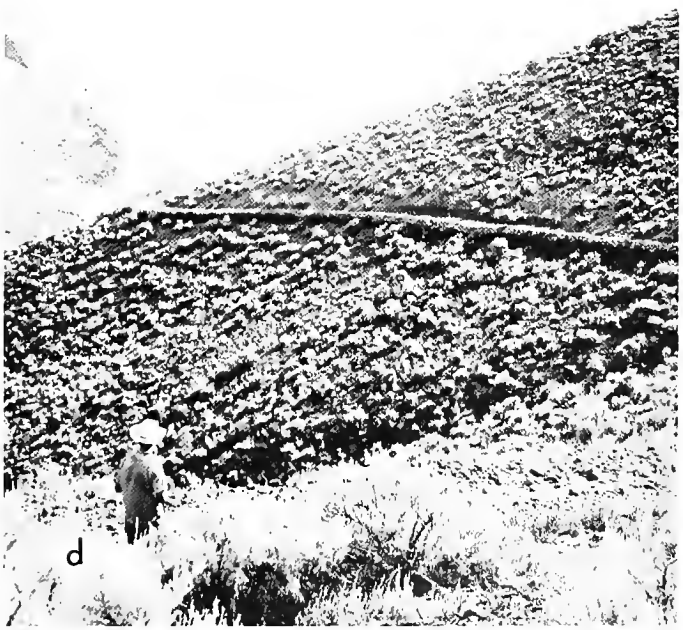

d

PLATE 4


a


b

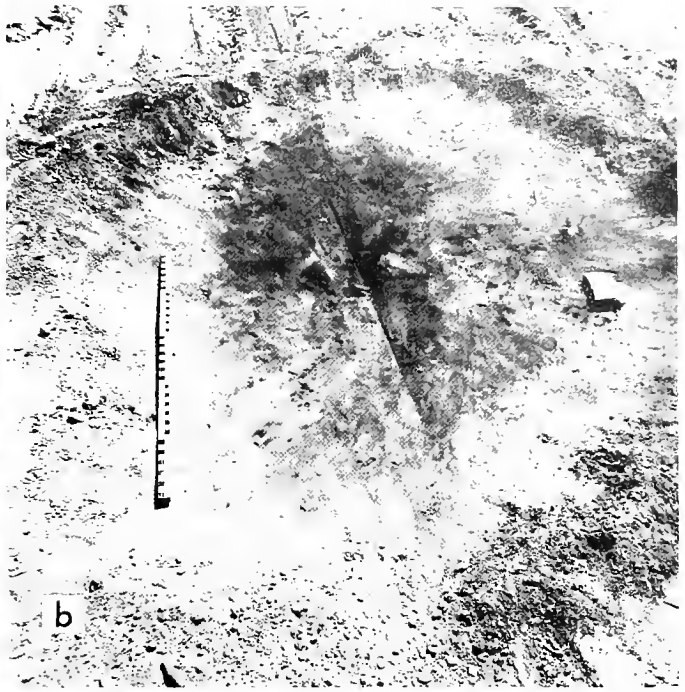

c


d

PLATE 5

PLATE 6

PLATE 7



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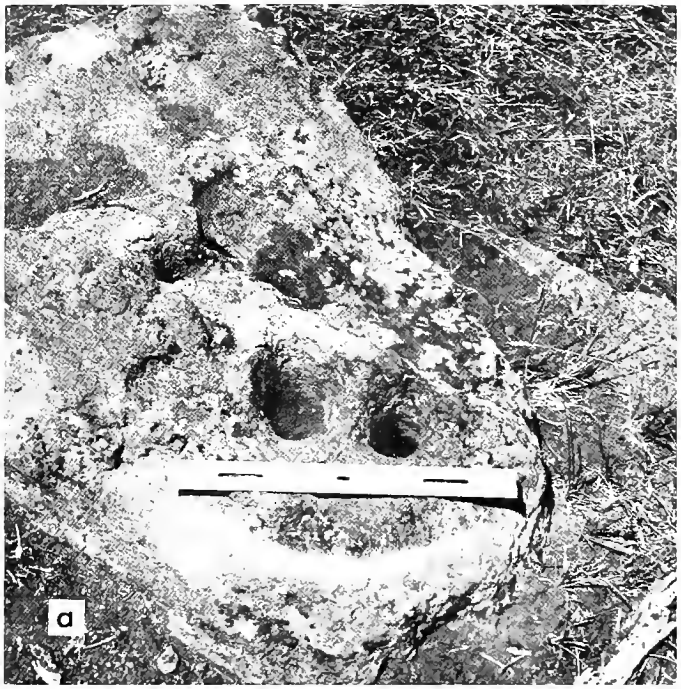

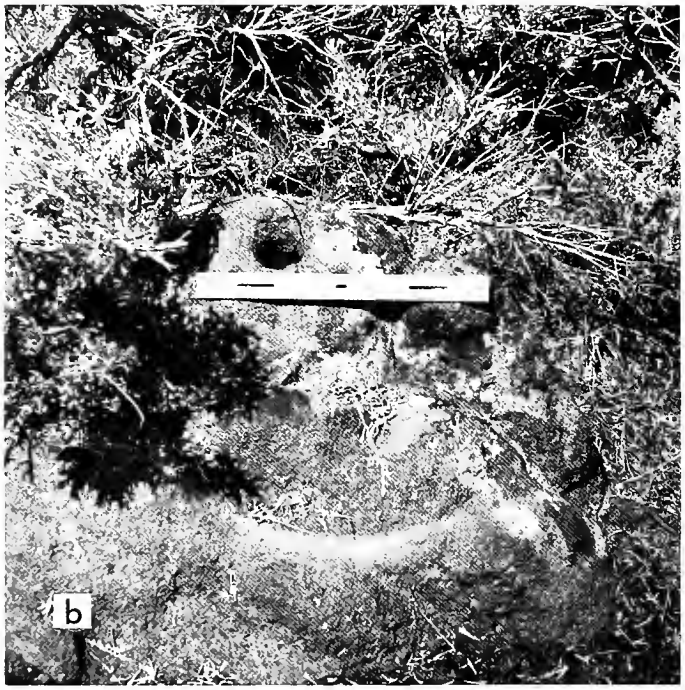

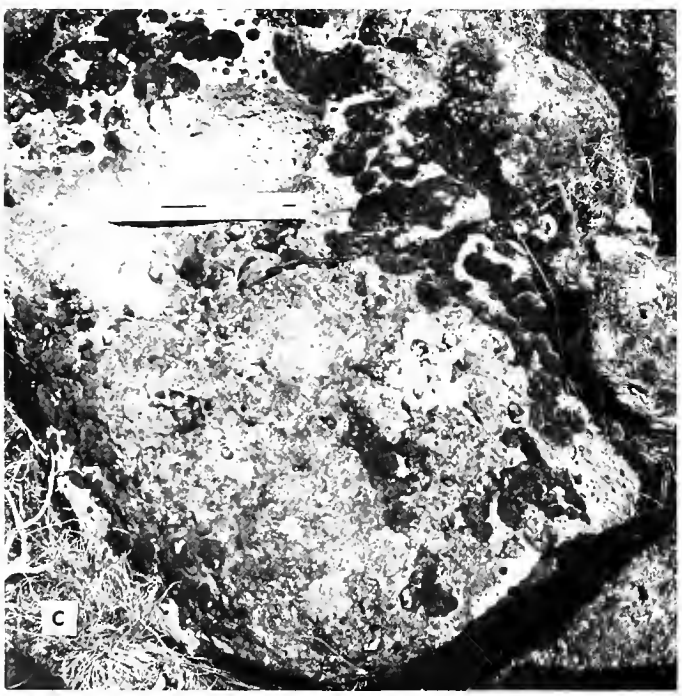

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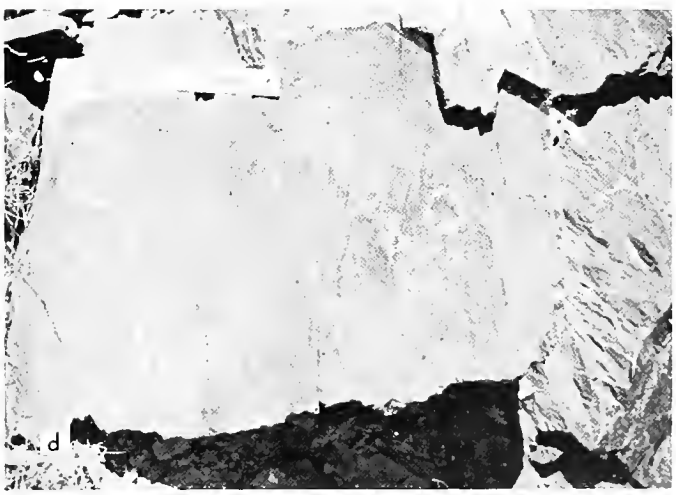

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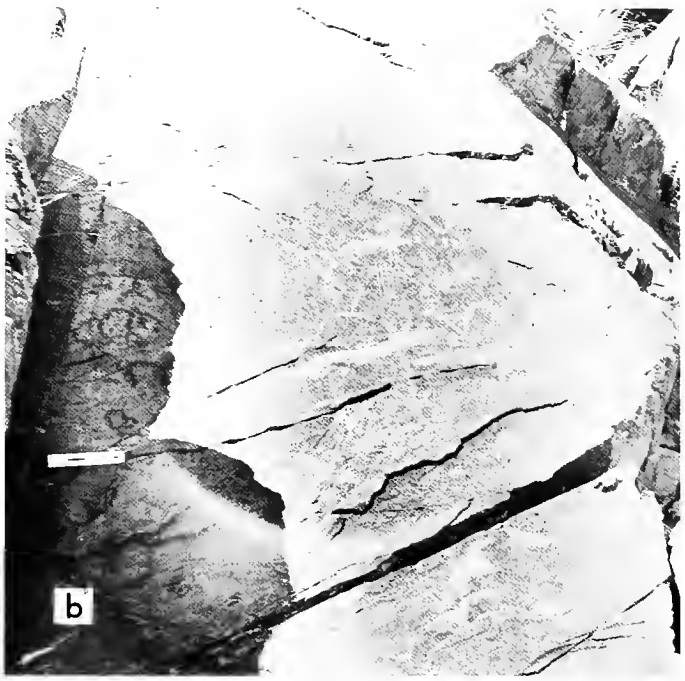

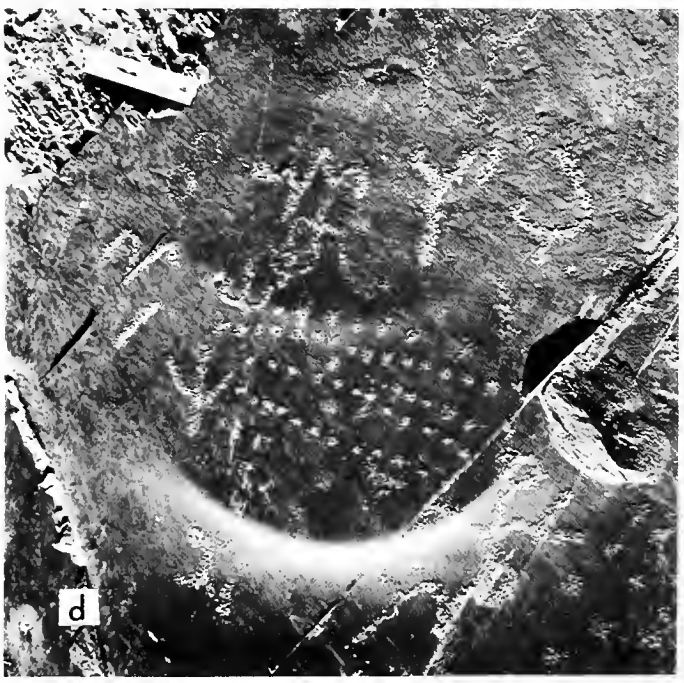

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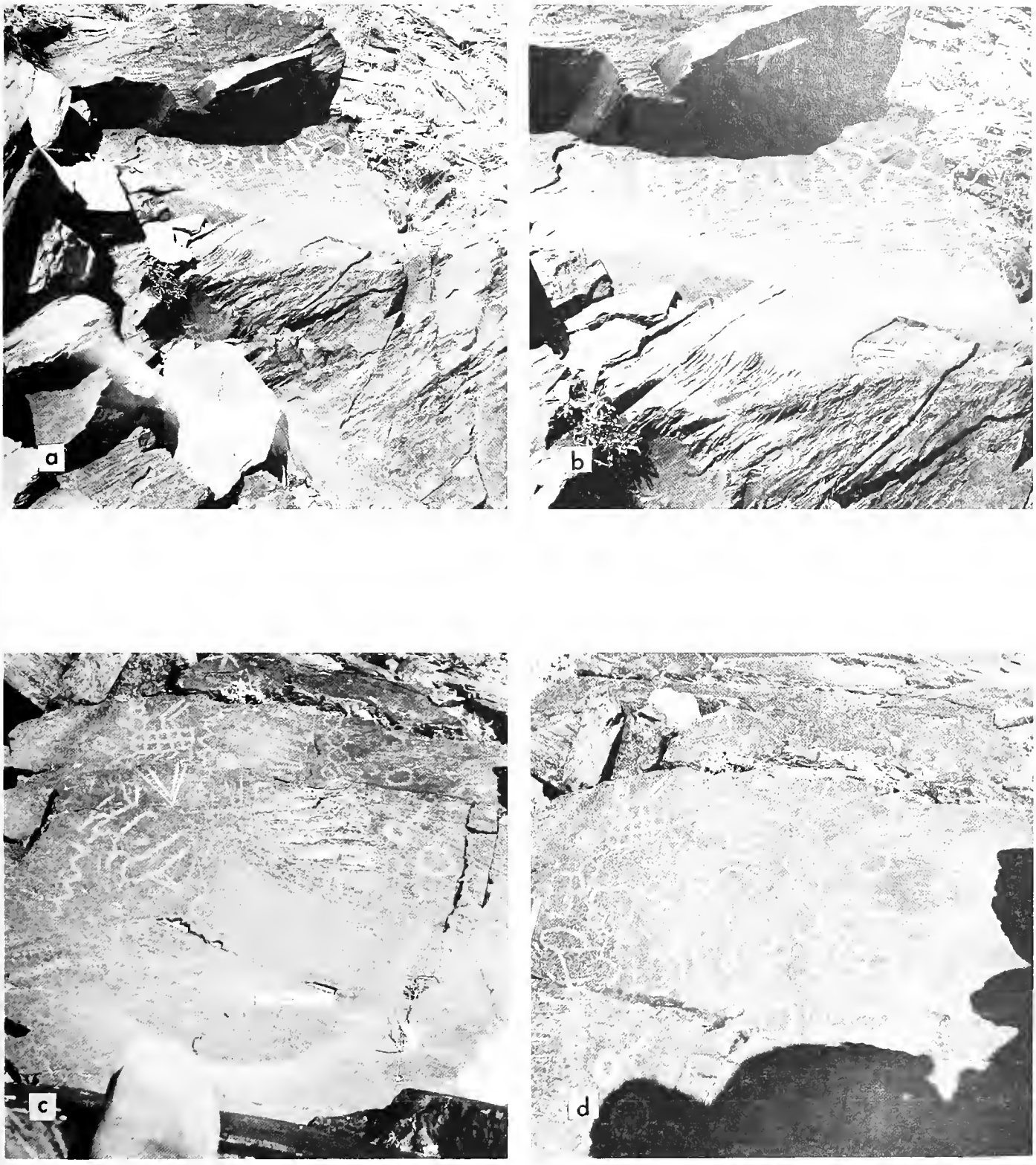

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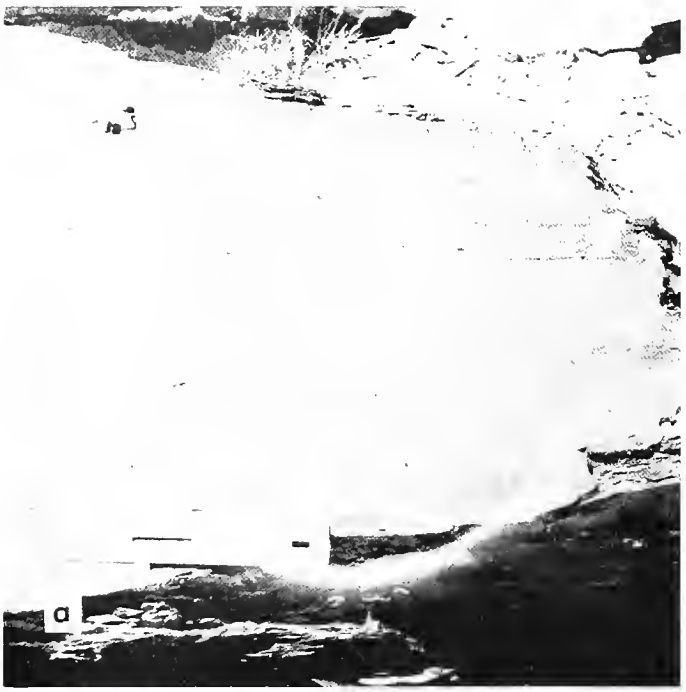

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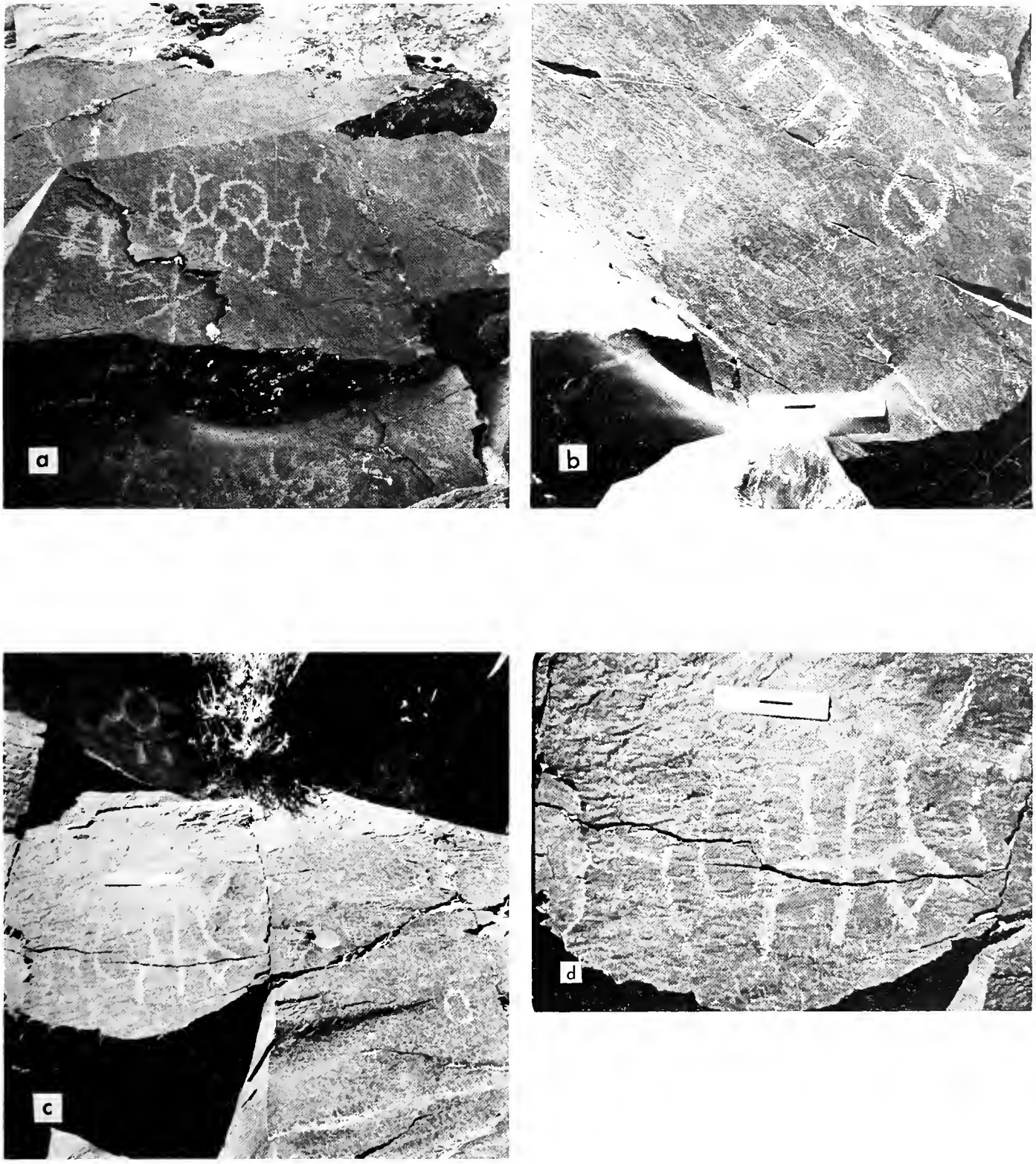


PLATE 14

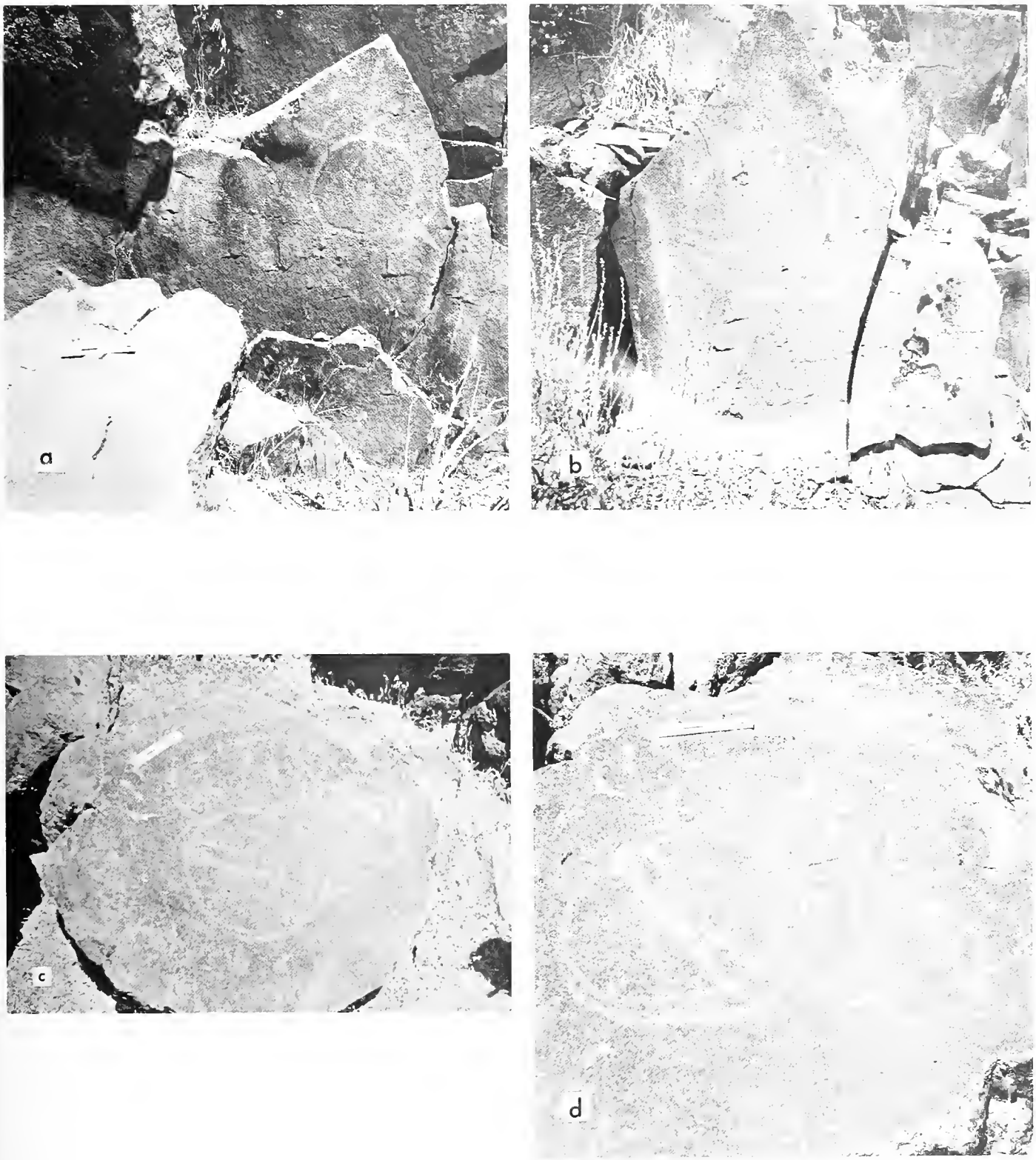

a


b


c


d

PLATE 15



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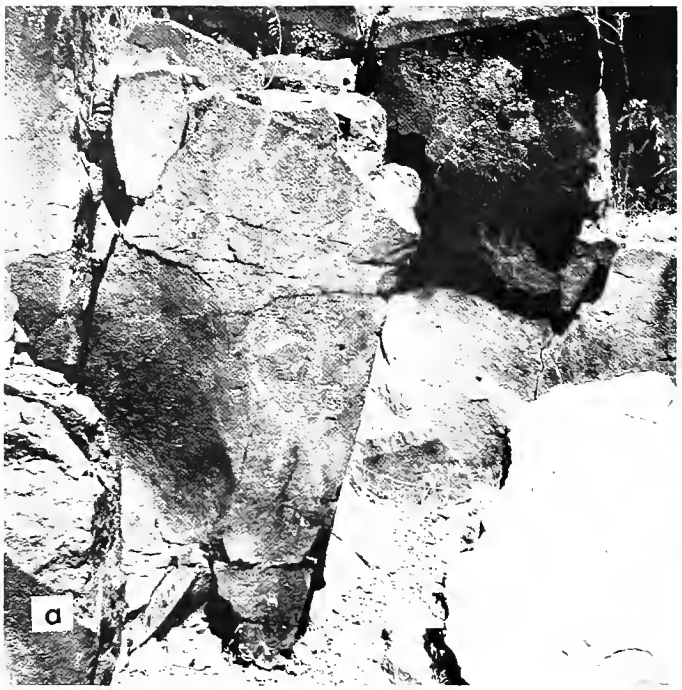


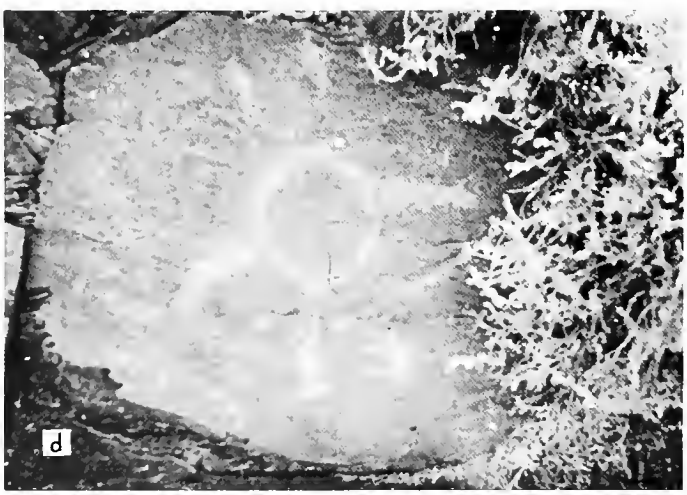


PLATE 17

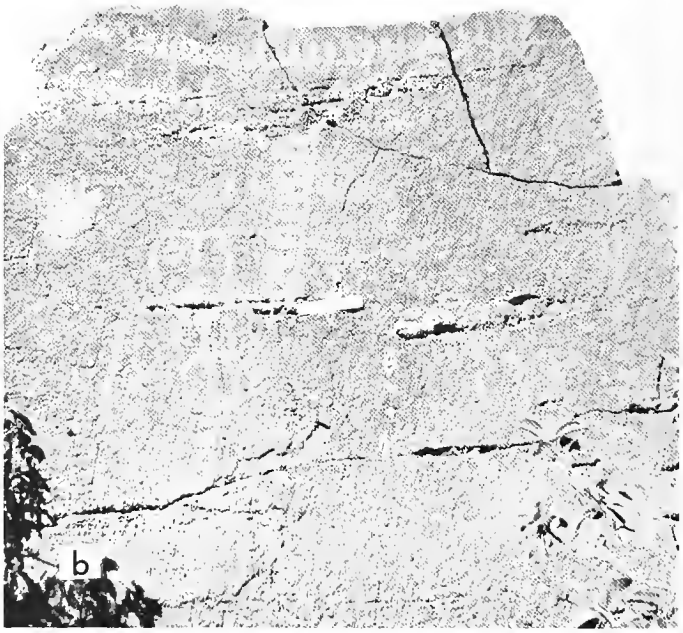

a


b


c


d

PLATE 18



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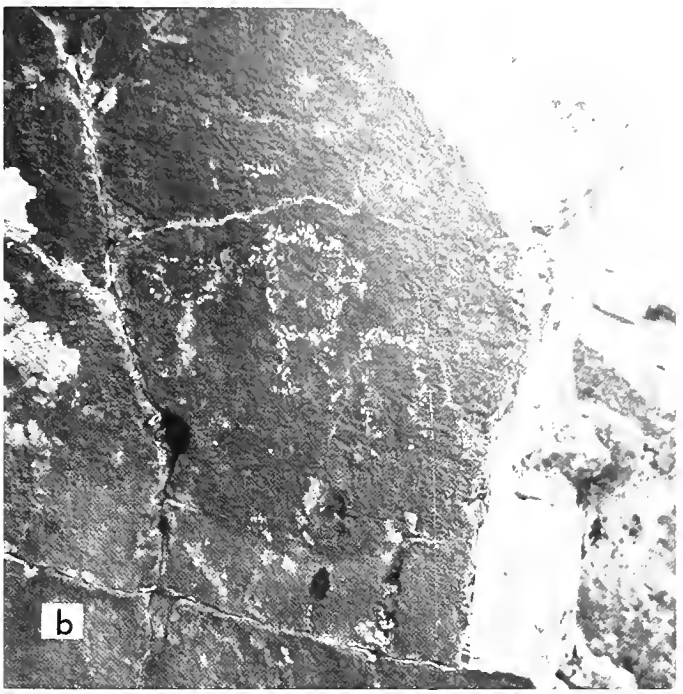

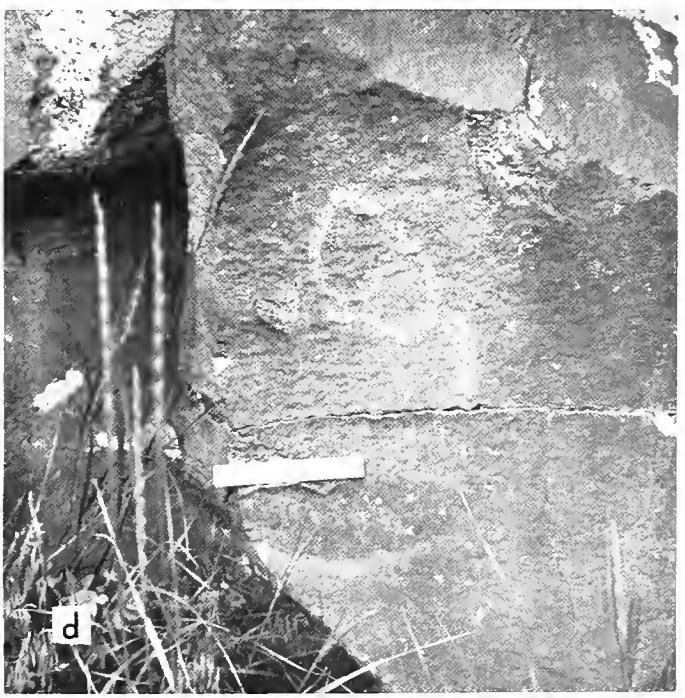

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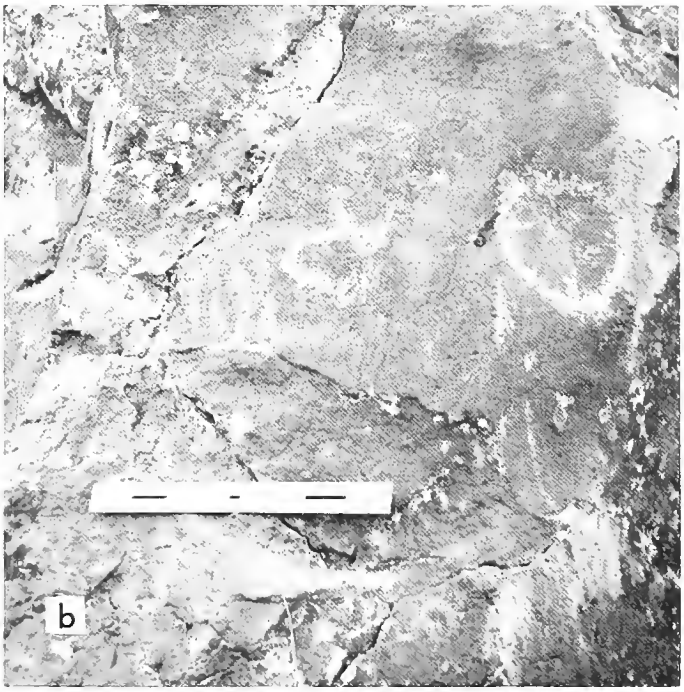

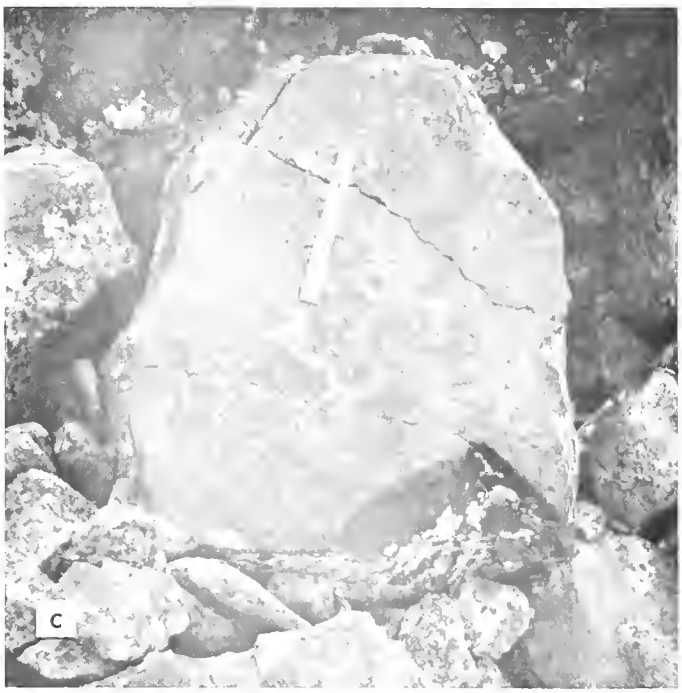

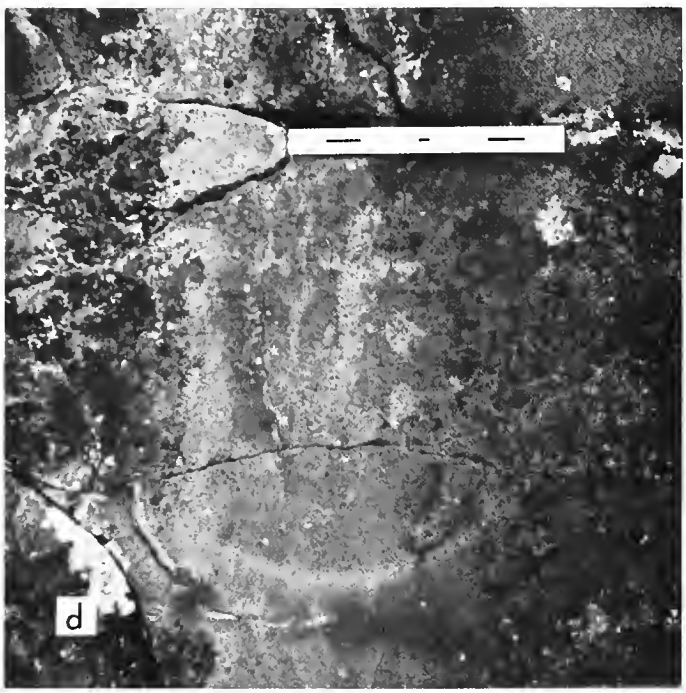

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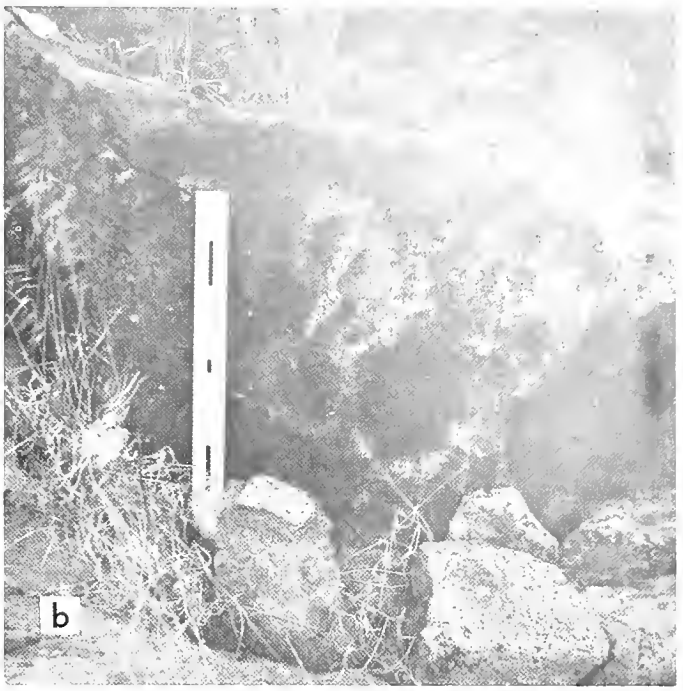

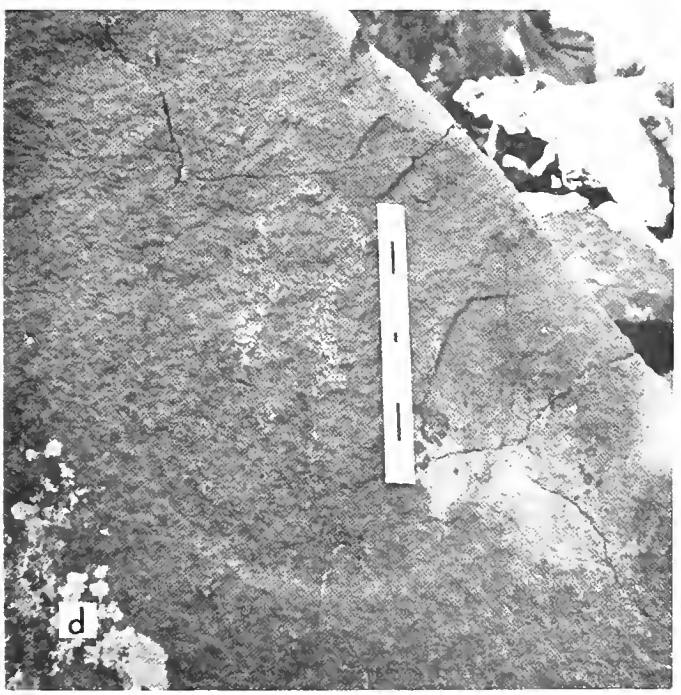

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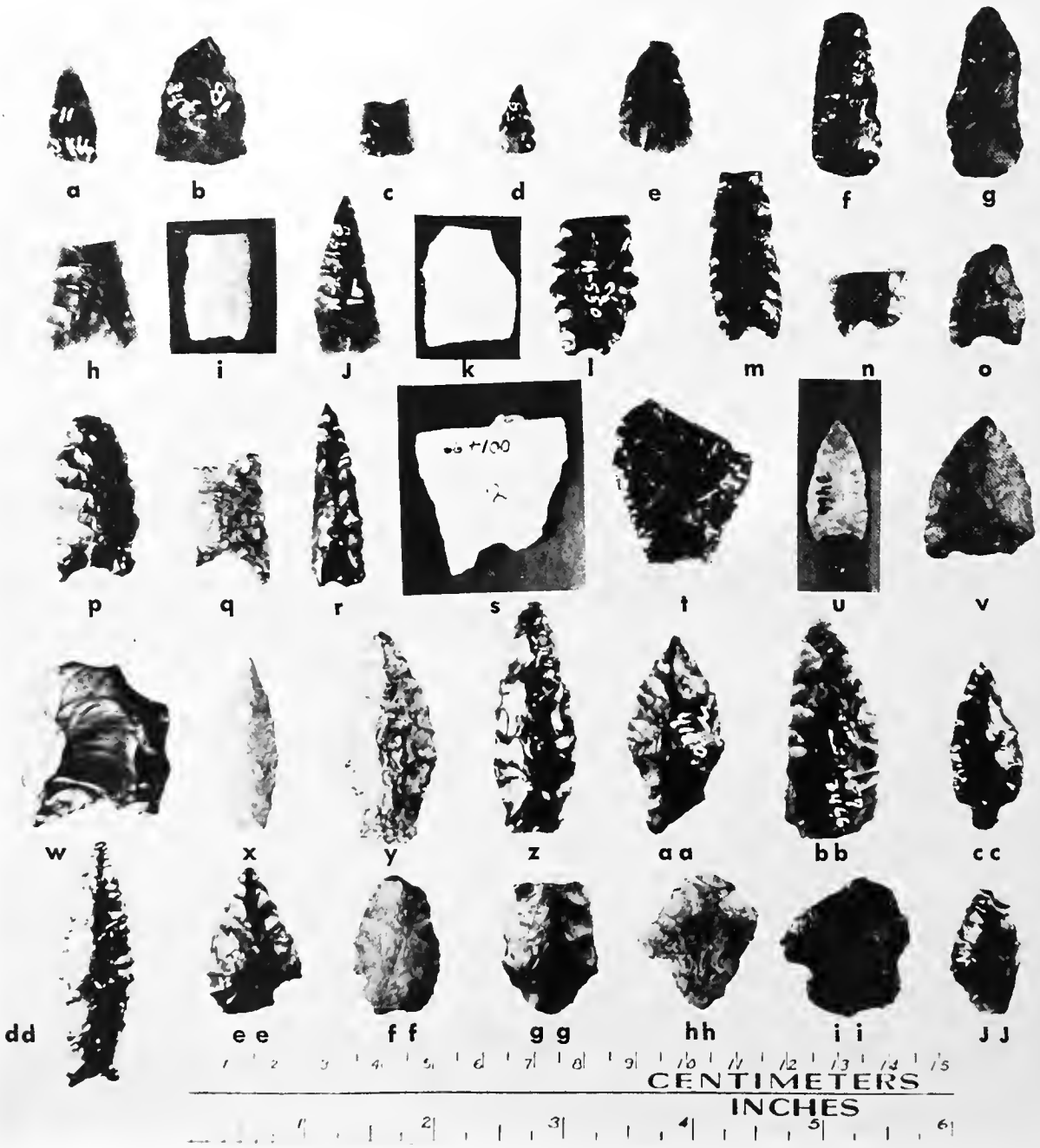
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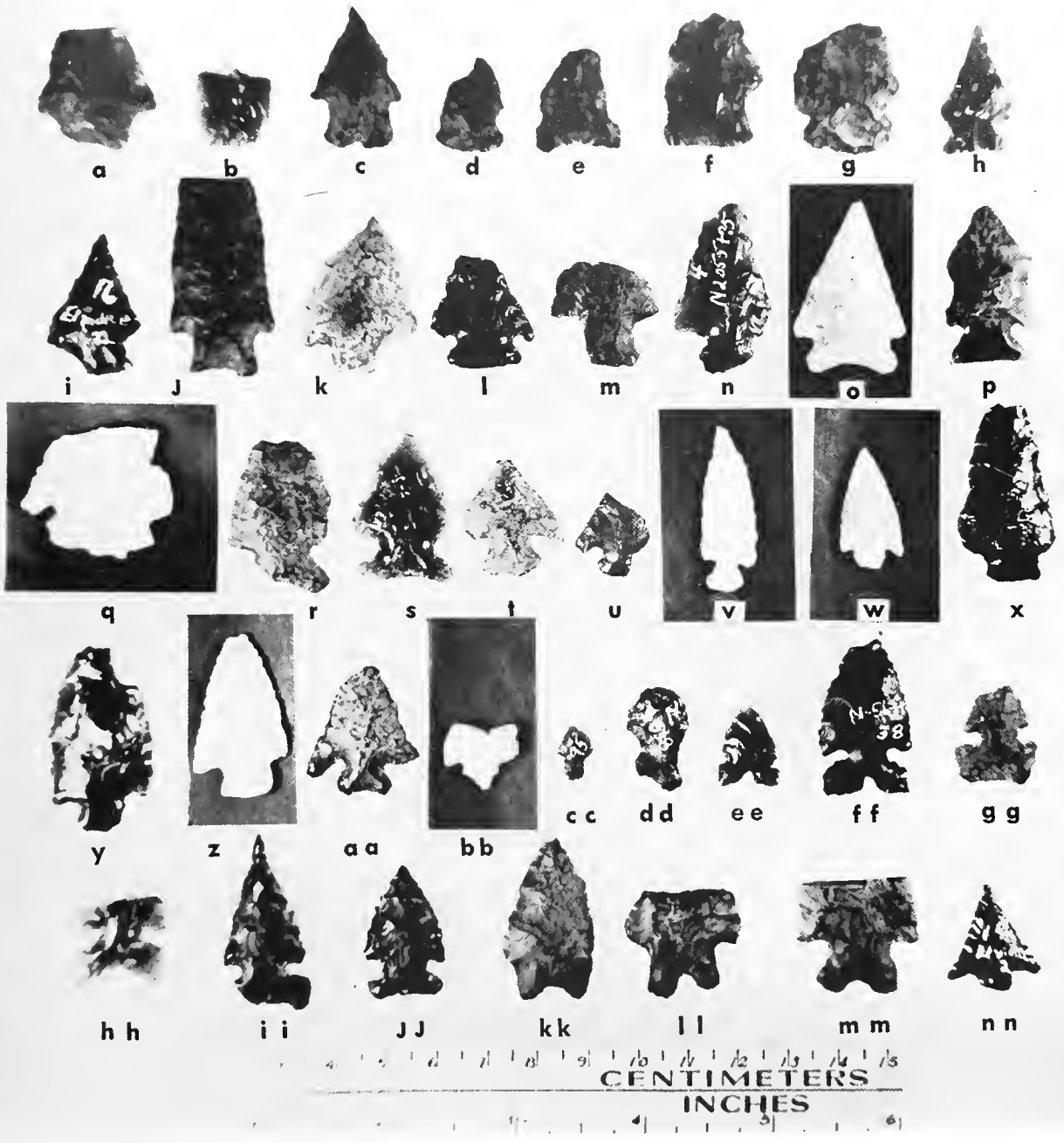
PLATE 23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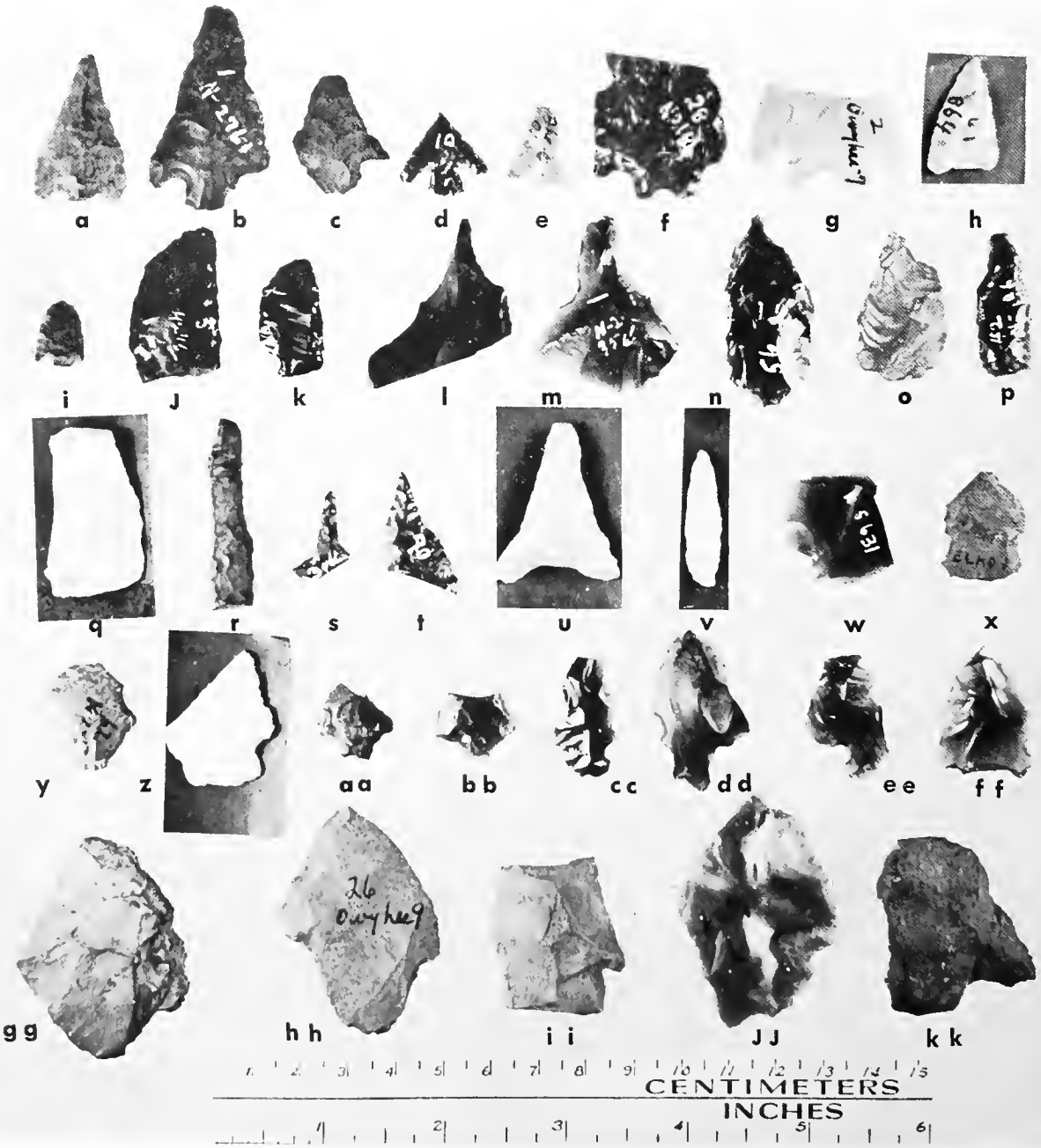
INCHES

PLATE 24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CENTIMETERS
INCHES

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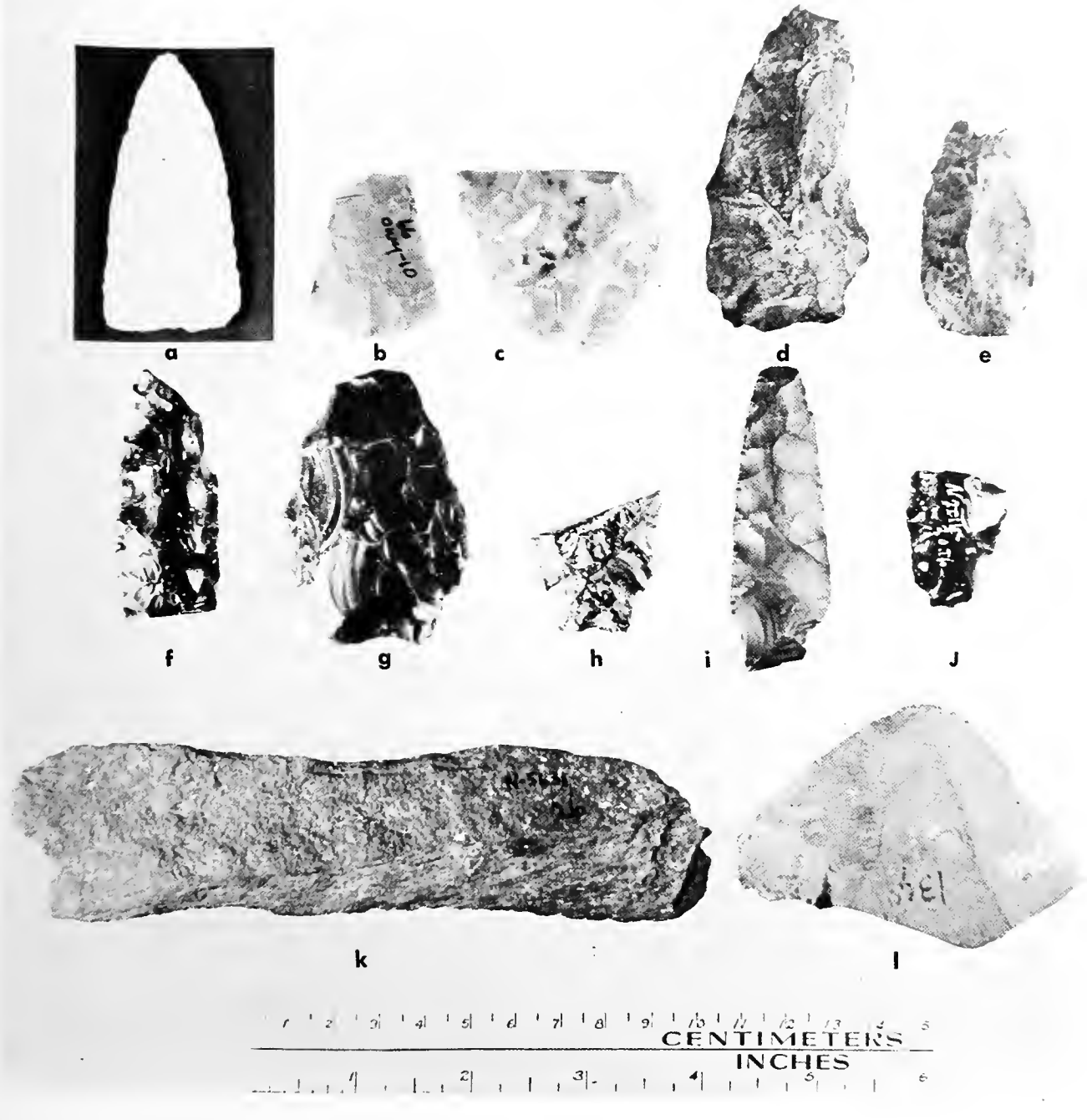

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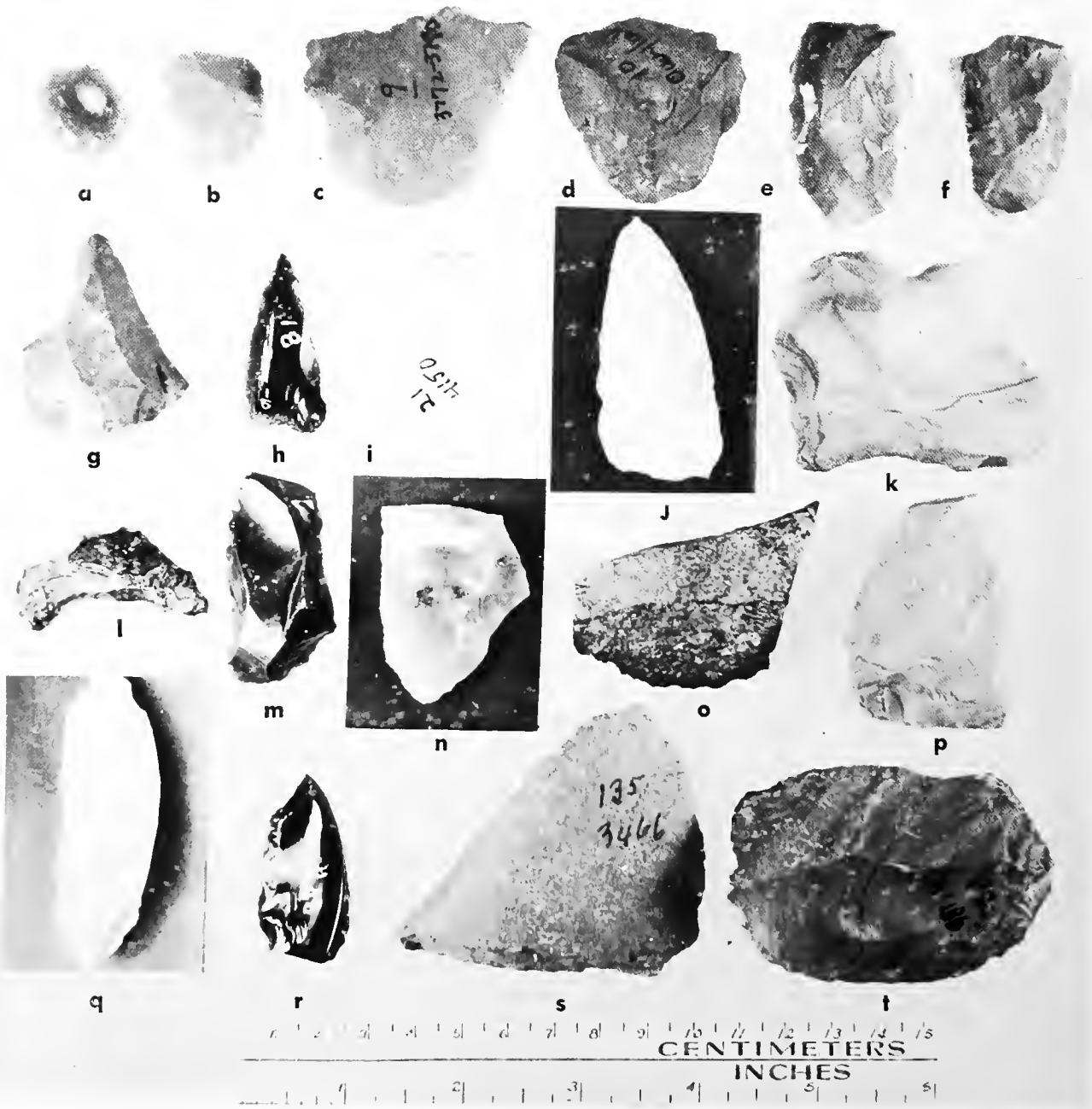

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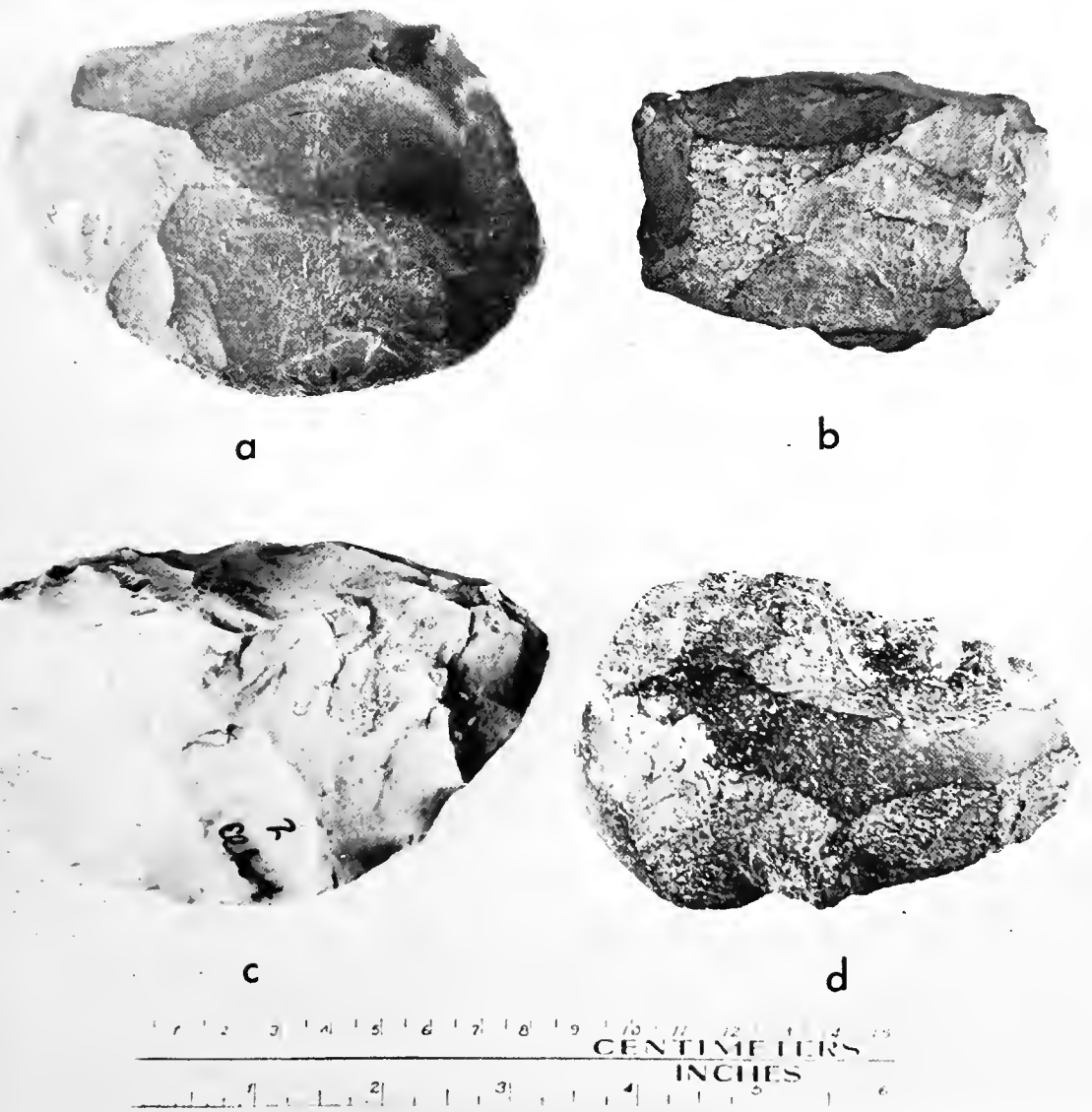

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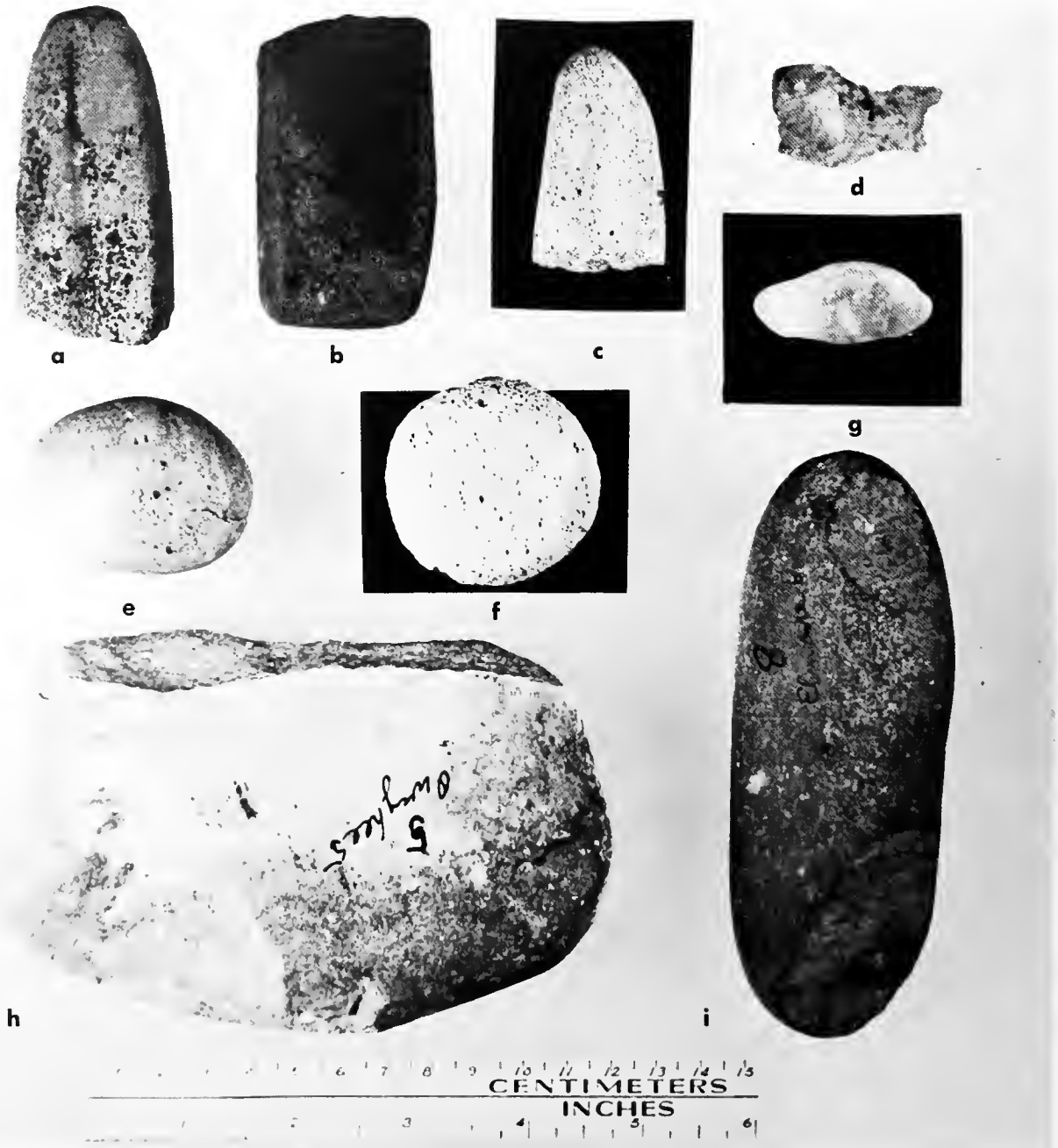

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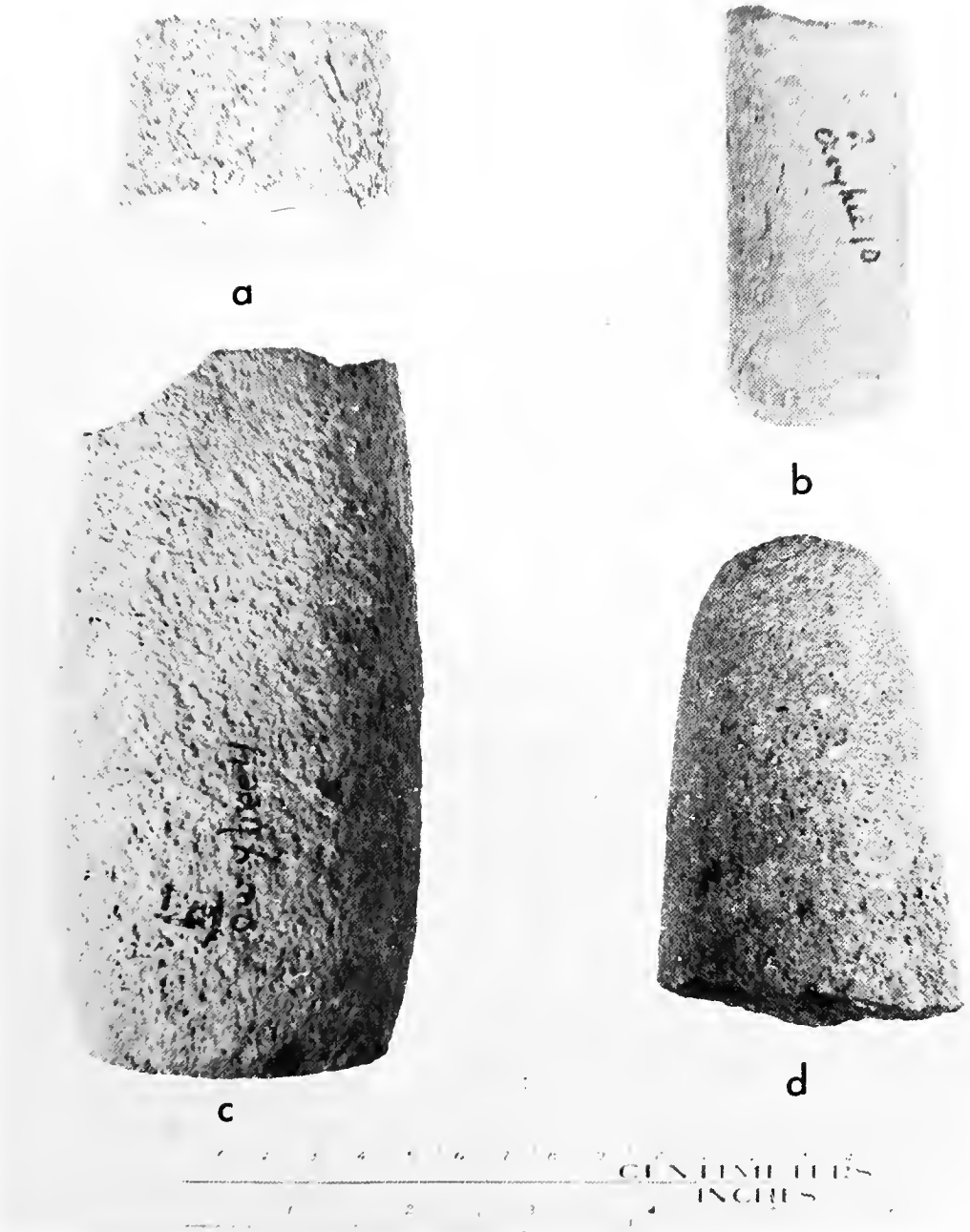


PLATE 30


CENTIMETERS
INCHES
b
CENTIMETERS
INCHES
a
CENTIMETERS
INCHES
c

PLATE 31

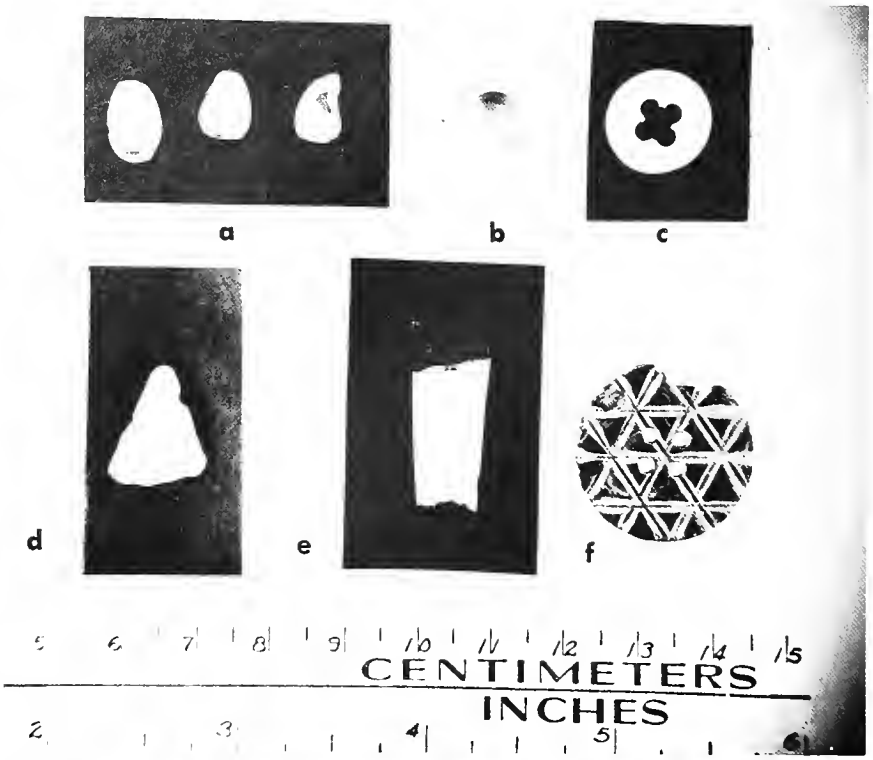
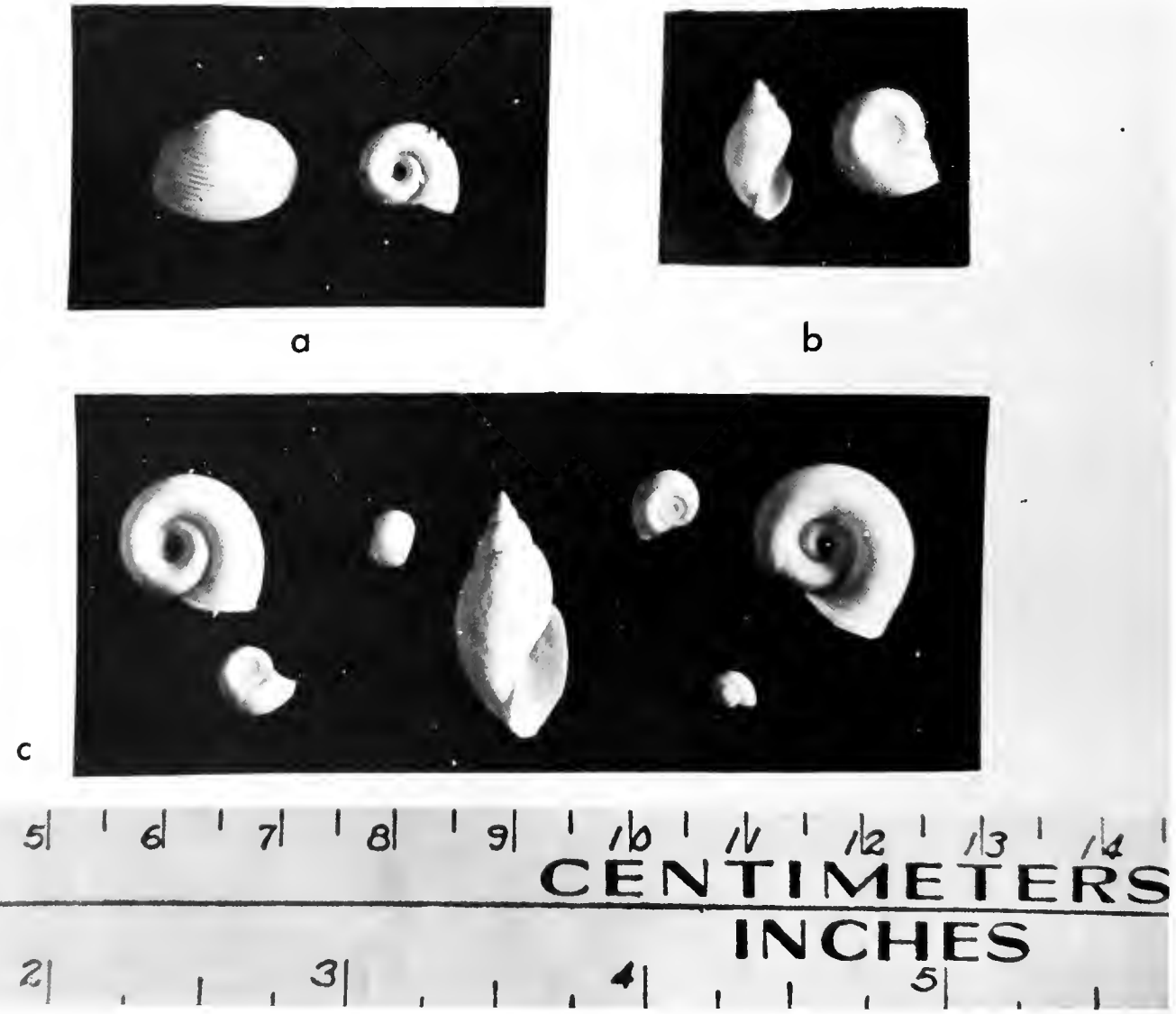


PLATE 32

PLATE 33



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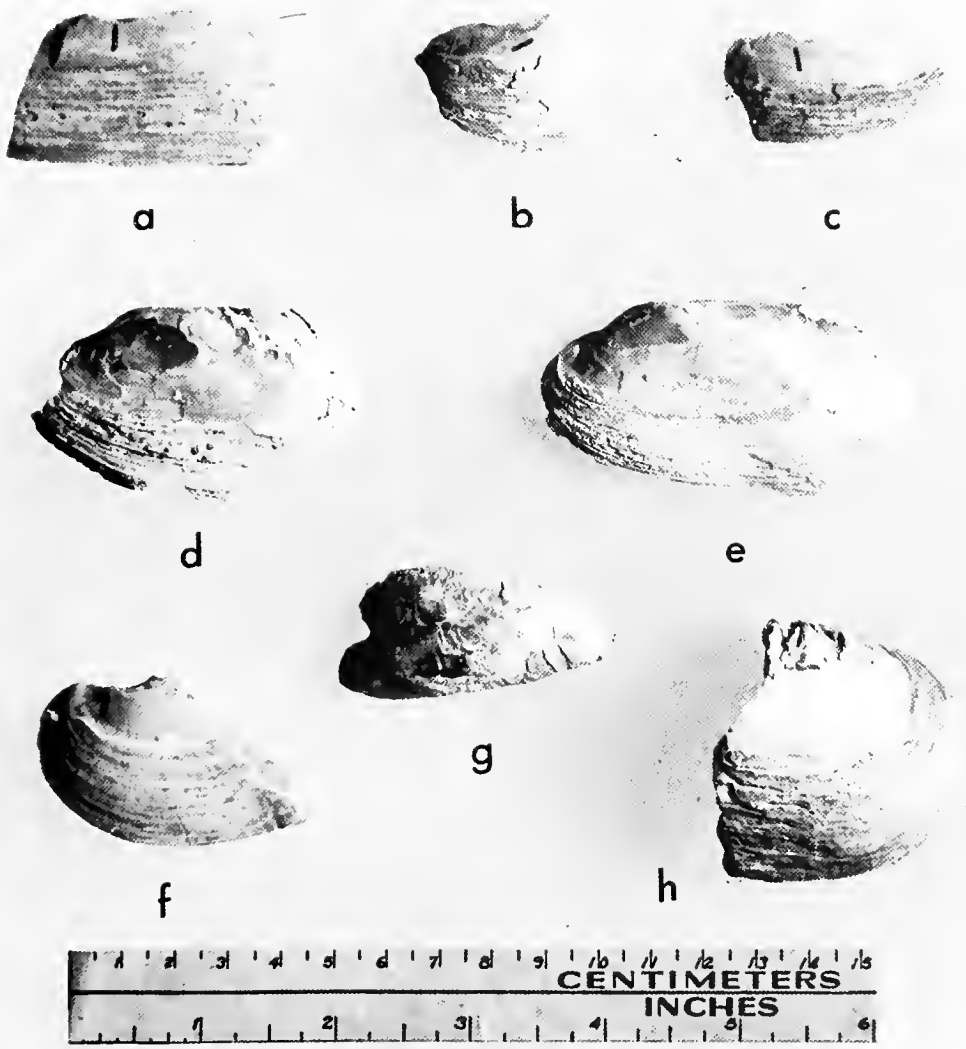

a

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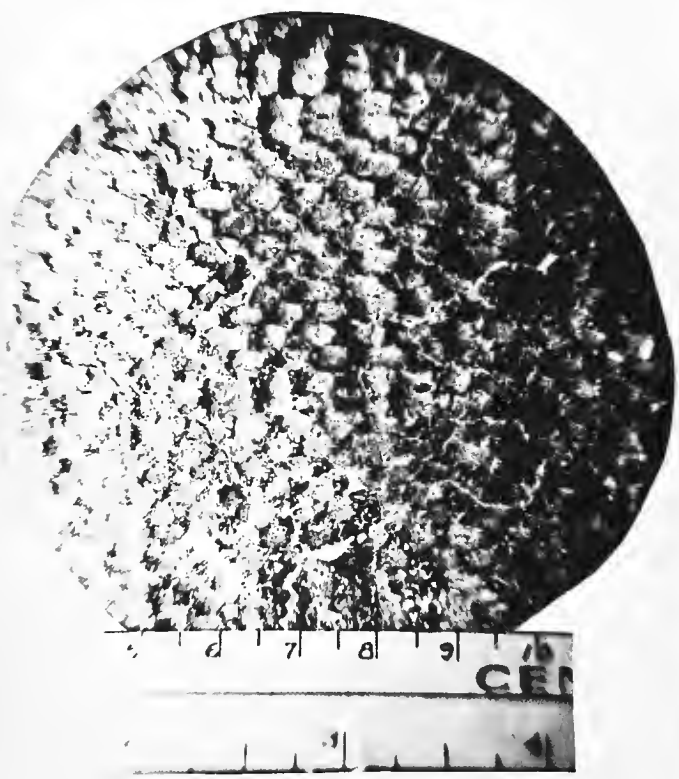
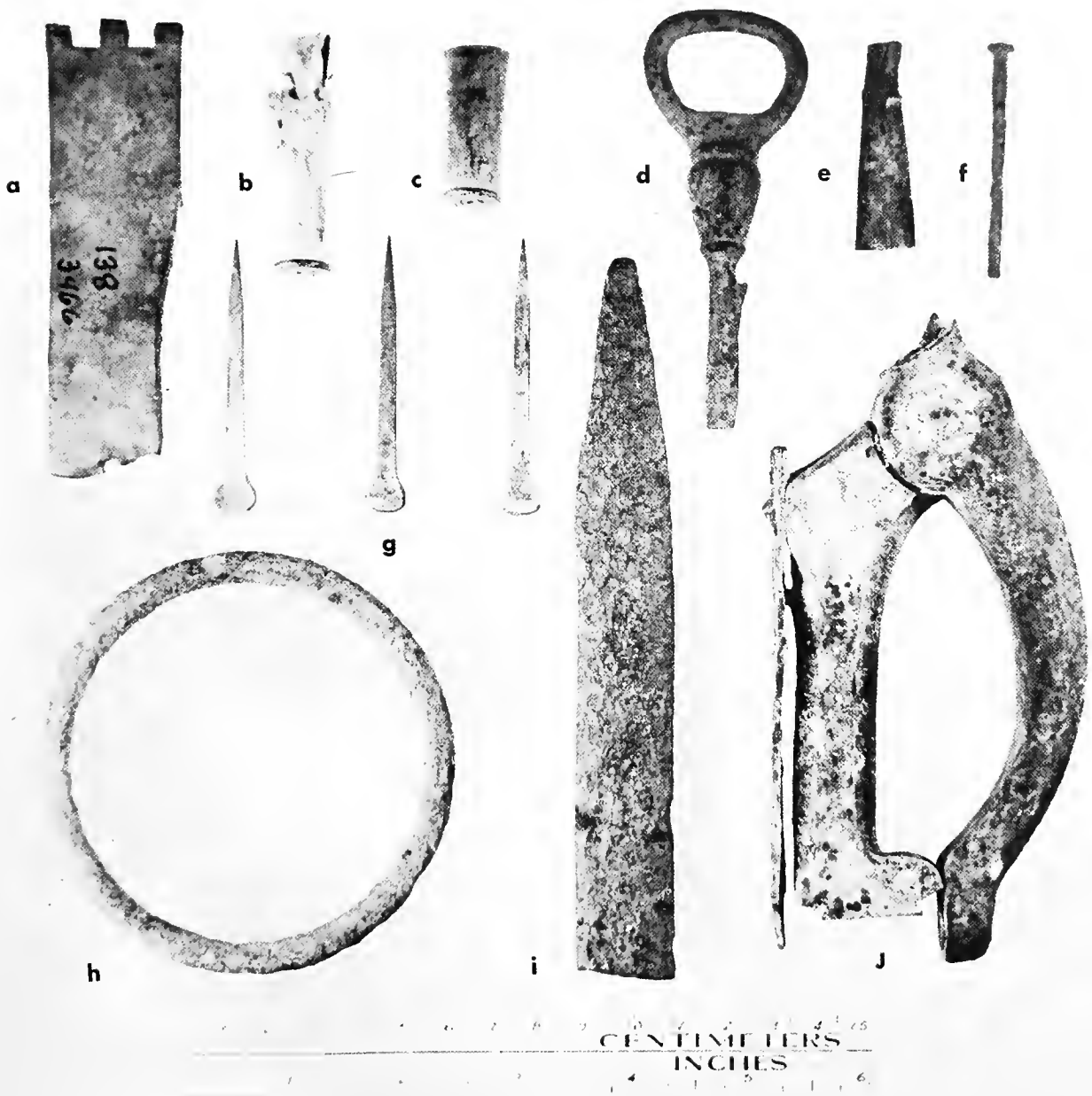


b

c

PLATE 36



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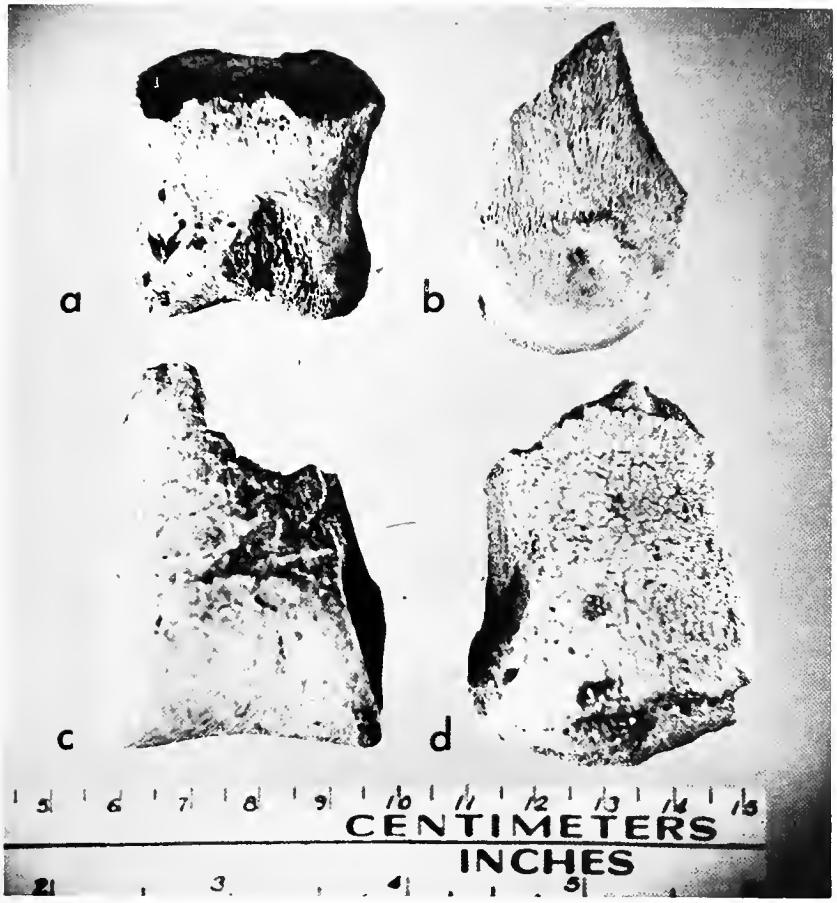


PLATE 38

PLATE 39

FIGURE 1

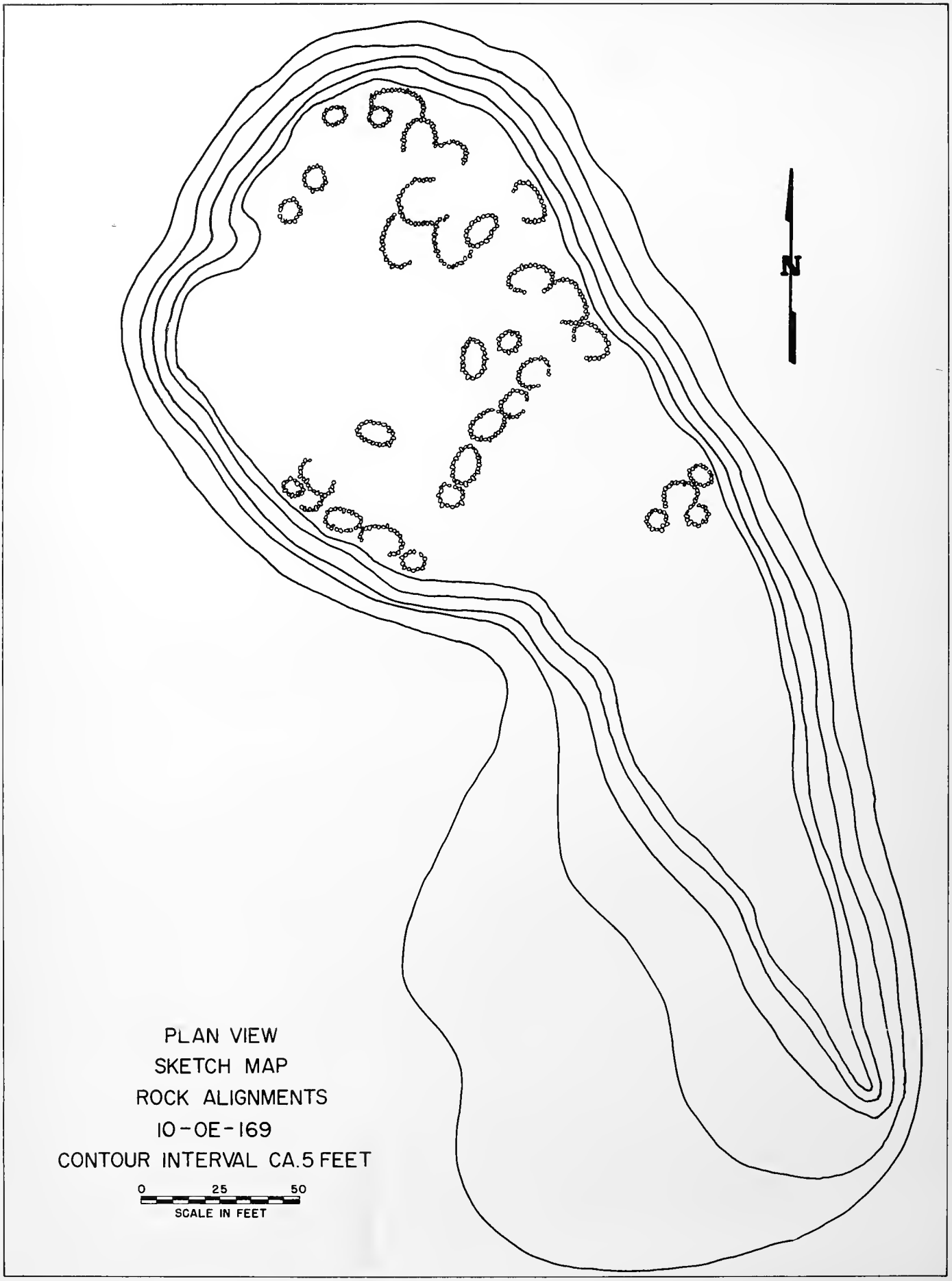

N
PLAN VIEW
SKETCH MAP
ROCK ALIGNMENTS
10-0E-169
CONTOUR INTERVAL CA.5 FEET
0 25 50
SCALE IN FEET

FIGURE 2

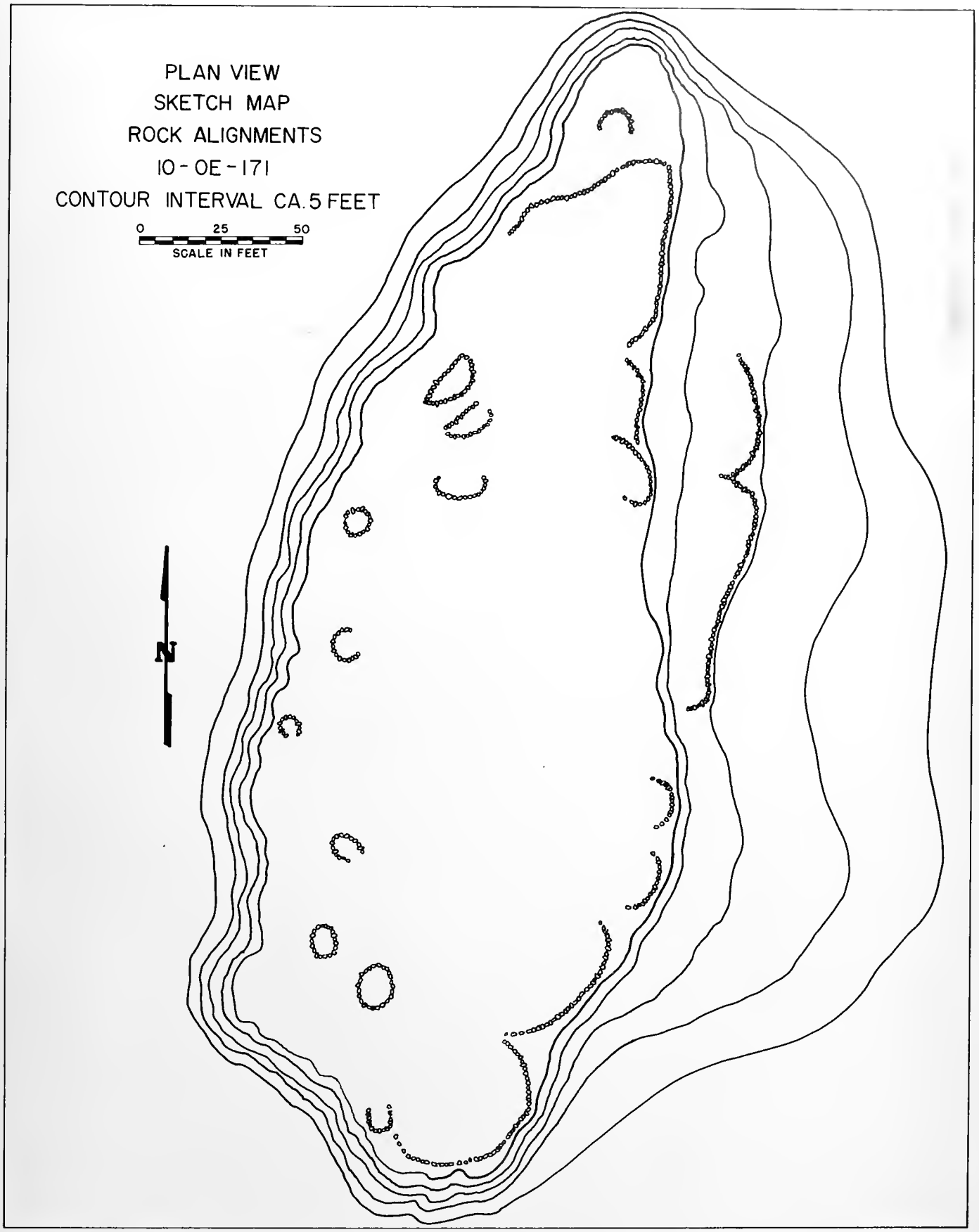

PLAN VIEW
SKETCH MAP
ROCK ALIGNMENTS
10-0E-171
CONTOUR INTERVAL CA. 5 FEET
0 25 50
SCALE IN FEET
N

FIGURE 3

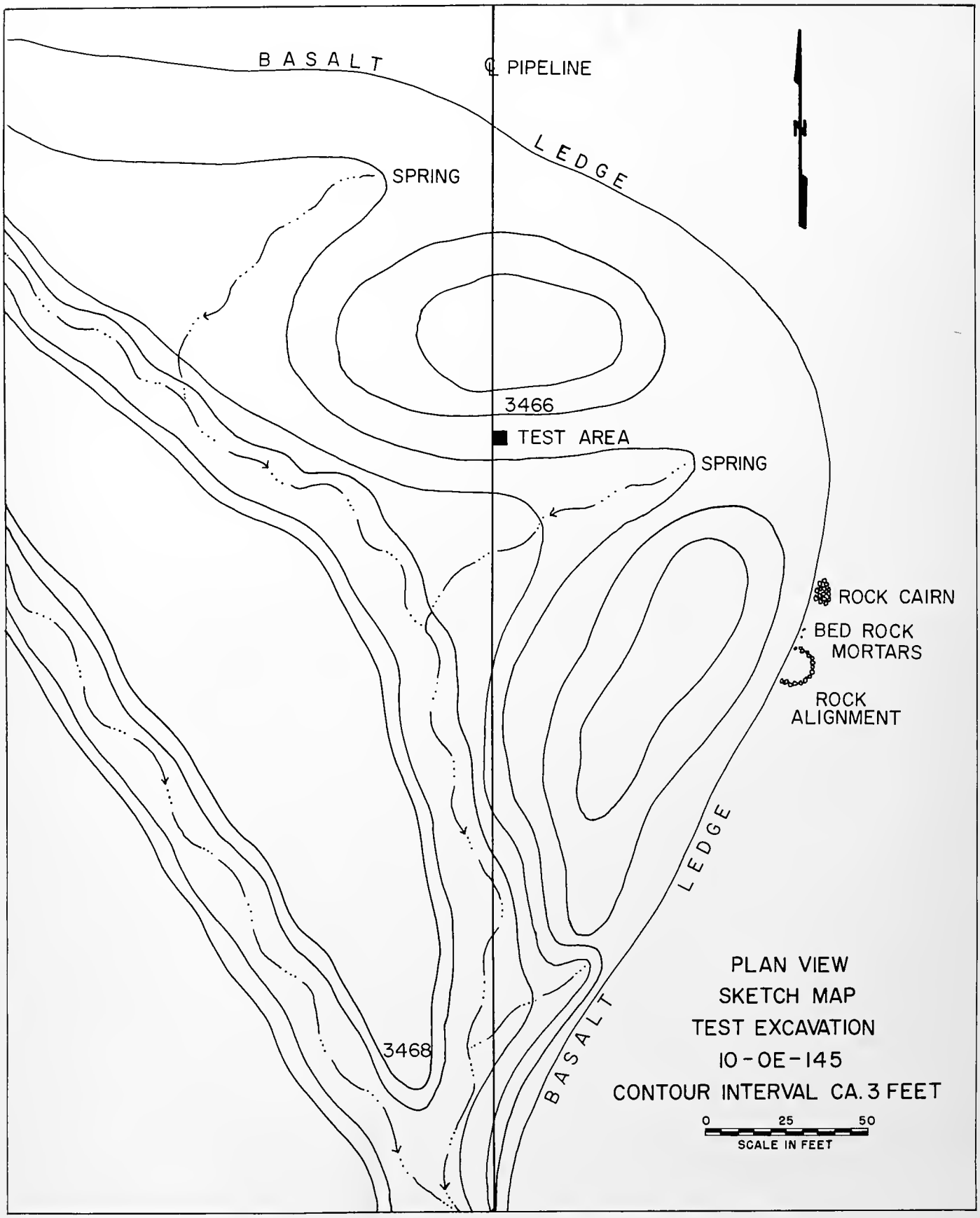
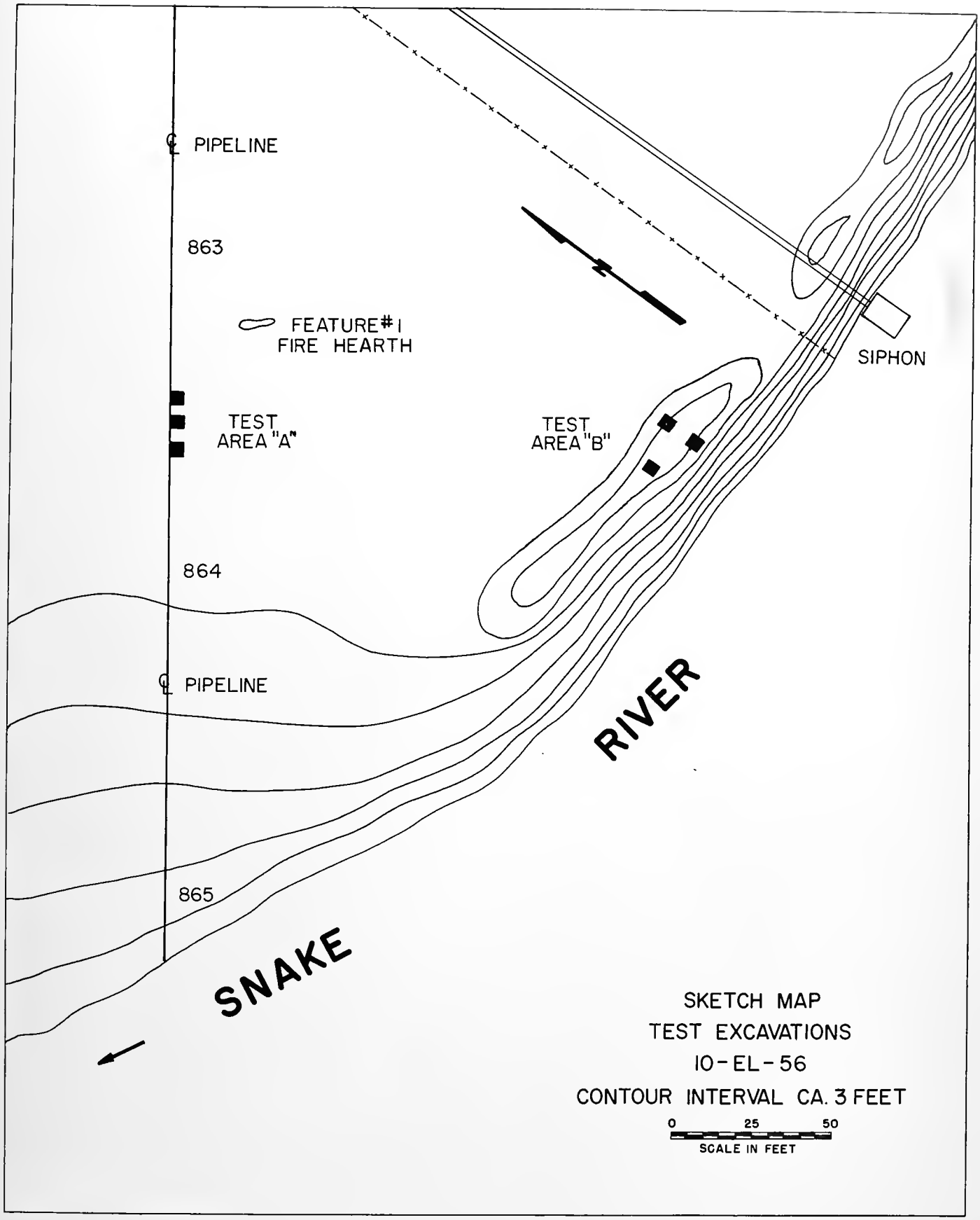
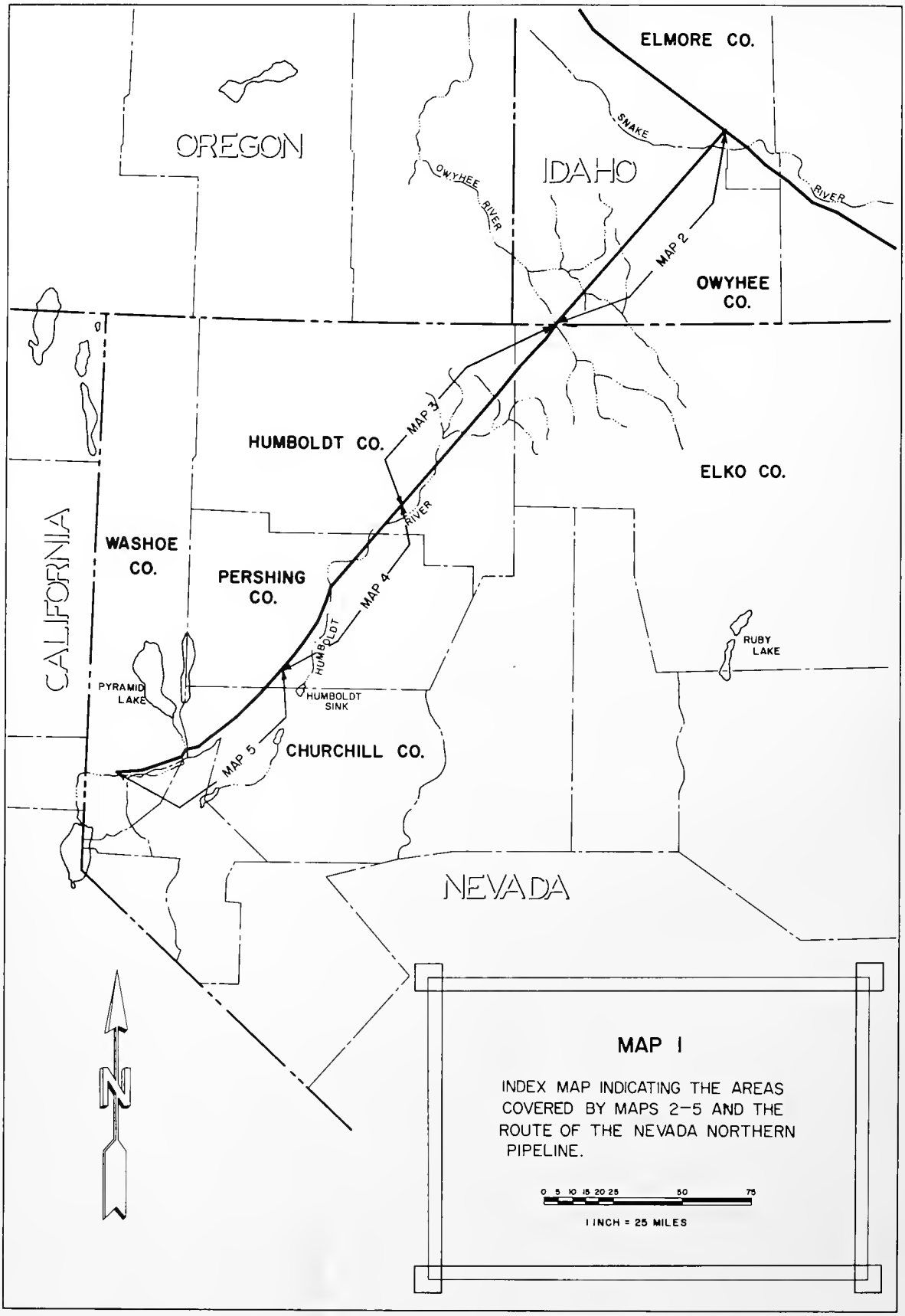
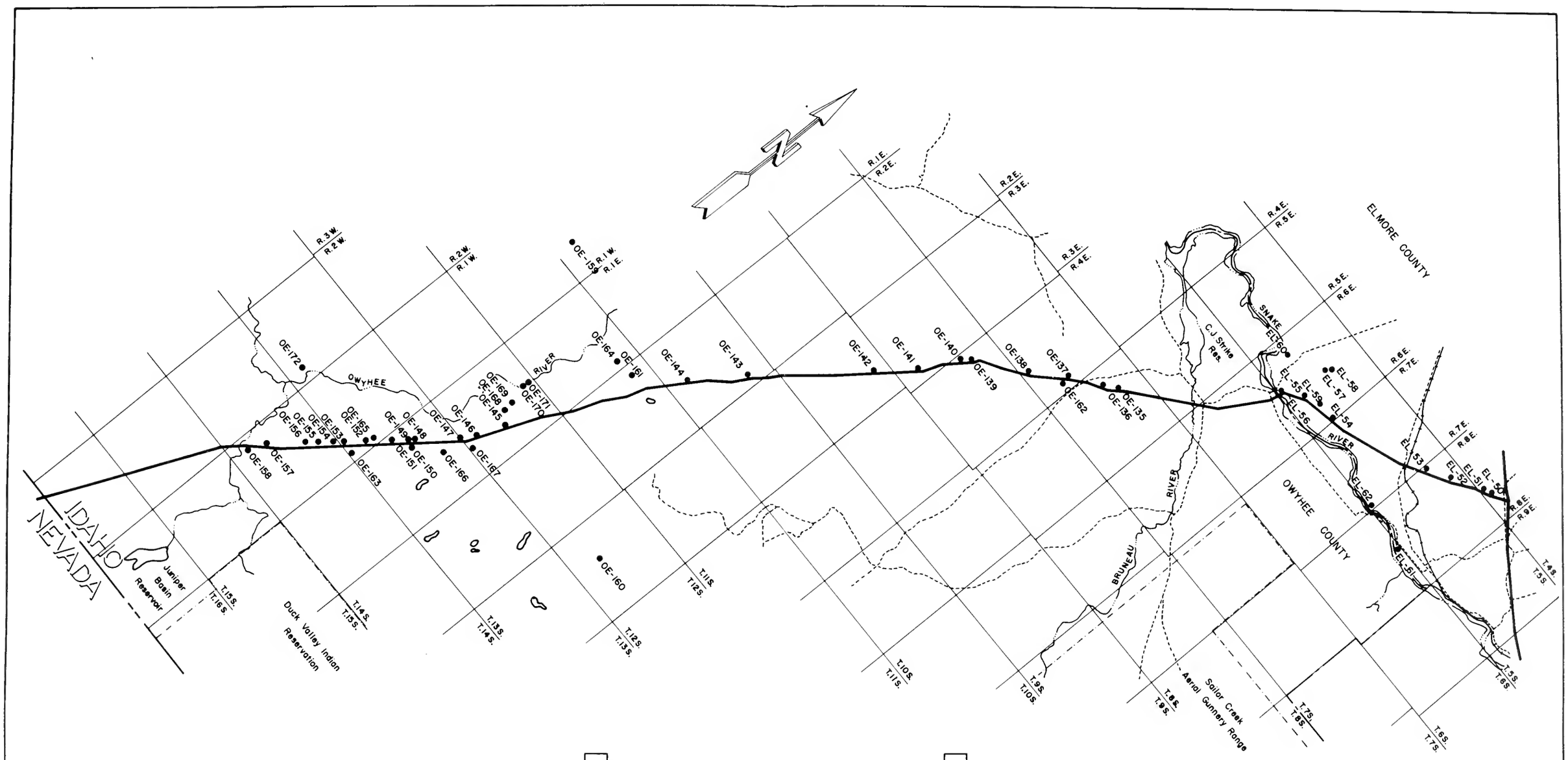

BASALT
℄ PIPELINE
LEDGE
N
SPRING
3466
TEST AREA
SPRING
ROCK CAIRN
BED ROCK MORTARS
ROCK ALIGNMENT
LEDGE
BASALT
3468
PLAN VIEW
SKETCH MAP
TEST EXCAVATION
10-0E-145
CONTOUR INTERVAL CA. 3 FEET
0 25 50
SCALE IN FEET

FIGURE 4


℄ PIPELINE
863
FEATURE#1
FIRE HEARTH
SIPHON
TEST
AREA "A"
TEST
AREA "B"
864
℄ PIPELINE
RIVER
865
SNAKE
SKETCH MAP
TEST EXCAVATIONS
10-EL-56
CONTOUR INTERVAL CA. 3 FEET
0 25 50
SCALE IN FEET


ELMORE CO.
SNAKE
RIVER
OREGON
IDAHO
OWYHEE
RIVER
MAP 2
OWYHEE
CO.
MAP 3
HUMBOLDT CO.
ELKO CO.
RIVER
CALIFORNIA
WASHOE
CO.
PERSHING
CO.
MAP 4
HUMBOLDT
RUBY
LAKE
PYRAMID
LAKE
HUMBOLDT
SINK
MAP 5
CHURCHILL CO.
NEVADA
N
MAP 1
INDEX MAP INDICATING THE AREAS
COVERED BY MAPS 2–5 AND THE
ROUTE OF THE NEVADA NORTHERN
PIPELINE.
0 5 10 15 20 25 50 75
1 INCH = 25 MILES

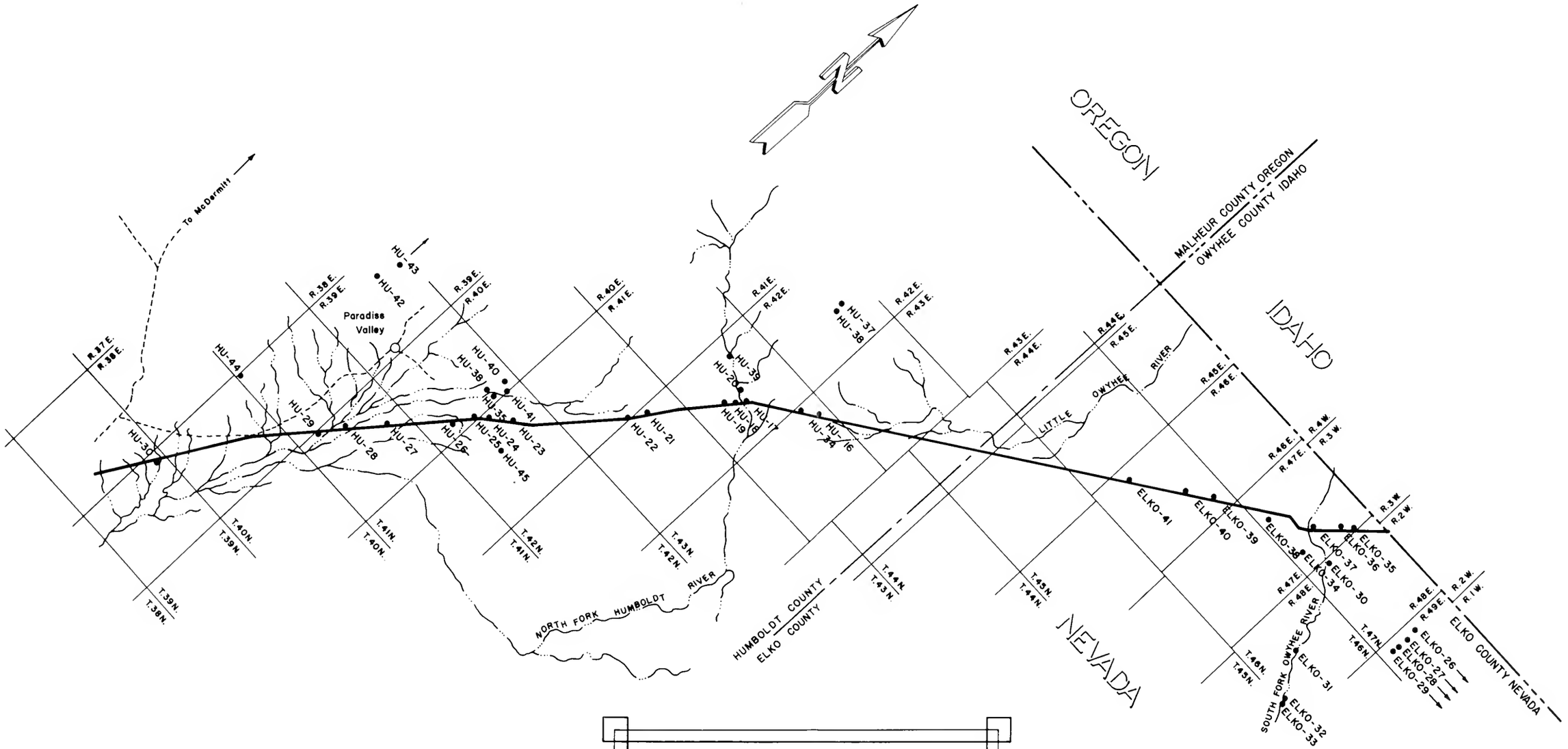


MAP 2

ARCHAEOLOGICAL SITES ON AND NEAR THE NEVADA NORTHERN NATURAL GAS PIPELINE, ELMORE CO. AND OWYHEE CO., IDAHO

0 1 2 3 4 5 6 12 18

- ARCHAEOLOGICAL SITES
- ROADS
- RAILROADS
- RIVERS
- BOUNDARIES



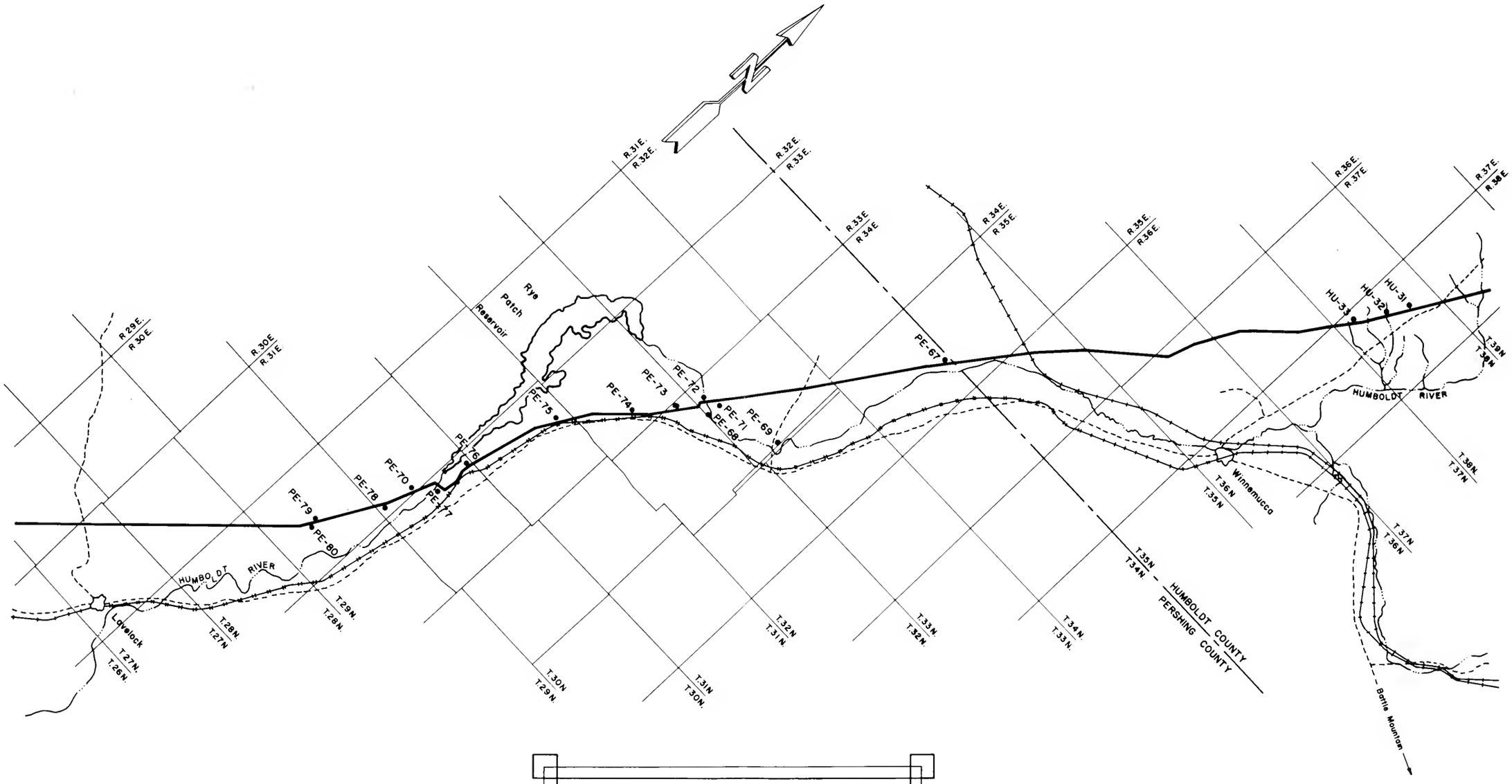
MAP 3

ARCHAEOLOGICAL SITES ON AND NEAR THE NEVADA NORTHERN NATURAL GAS PIPELINE; ELKO CO. AND HUMBOLDT CO., NEVADA.

0 1 2 3 4 5 6 12 18

● ARCHAEOLOGICAL SITES ROADS

RAILROADS RIVERS



MAP 4

ARCHAEOLOGICAL SITES ON AND NEAR THE NEVADA NORTHERN NATURAL GAS PIPELINE; HUMBOLDT CO. AND PERSHING CO., NEVADA.

0 1 2 3 4 5 6 12 18

● ARCHAEOLOGICAL SITES ROADS

RAILROADS RIVERS

Rena
Pyramid Lake
Pyramid Lake Indian Reservation
R.20E. R.21E.
R.21E. R.22E.
R.22E. R.23E.
R.23E. R.24E.
R.24E. R.25E.
R.25E. R.26E.
R.26E. R.27E.
R.27E. R.28E.
R.28E. R.29E.
R.29E. R.30E.
R.30E. R.31E.
Novol Gunnery Range
TRUCKEE
WASHOE COUNTY
STOREY COUNTY
RIVER
STOREY COUNTY / LYON COUNTY
LYON COUNTY / CHURCHILL COUNTY
PERSHING COUNTY / CHURCHILL COUNTY
PE-81
PE-82
T.19N. T.18N.
T.20N. T.19N.
T.21N. T.20N.
T.22N. T.21N.
T.23N. T.22N.
T.24N. T.23N.
T.25N. T.24N.
T.26N. T.25N.
T.28N. T.27N.
T.27N. T.26N.
Humboldt Sink
Southern Pocific

MAP 5

ARCHAEOLOGICAL SITES ON AND NEAR THE NEVADA NORTHERN NATURAL GAS PIPELINE, PERSHING CO., CHURCHILL CO. AND WASHOE CO., NEVADA.

0 1 2 3 4 5 6 12 18

● ARCHAEOLOGICAL SITES — ROADS
RAILROADS — RIVERS
BOUNDARIES